STUDIES ON LEARNING ORGANIZATION, COMMUNITY PARTICIPATION AND SCHOOL EFFECTIVENESS AT PRIMARY STAGE

International Perspective

A Compendium of Studies Presented at the International Seminar on Learning Organization, Community Participation and School Effectiveness at Primary Stage organised by the NCERT in New Delhi from 15 to 17 July 1998 under the aegis of the District Primary Education Programme of the Government of India

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
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Seminar Director

A. K. Sharma

Seminar Executives

A.N. Maheshwari
Ved Prakash
S.K S. Gautam
I.K. Bansal
(Smt.) M. Bhalla

Edited by

Ved Prakash

Foreword

It is encouraging that educational researchers have started undertaking studies on the issues and problems of primary education, especially in the context of universalisation of primary education. A climate now has been created in the country under which the university system is evincing increasing interest in investigating the problem areas of primary education. This augurs well for the educational scene which is facing unprecedented challenges. The studies reported in this volume are a few of those that were selected for presentation in the 1998 International Seminar on Learning Organisation, Community Participation and School Effectiveness at Primary Stage organised by the National Council of Educational Research and Training (NCERT) from 15 to 17 July 1998 under the aegis of the District Primary Education Programme (DPEP).

I wish to express my deep appreciation for the support provided by the DPEP Bureau of the Ministry of Human Resource Development (MHRD) that enabled us to organise and conduct the seminar successfully. The enthusiastic support of the international funding agencies, namely the European Commission, the DFID, UK and the UNICEF in sponsoring the participation of the foreign scholars to this seminar is gratefully acknowledged.

My colleague, Ved Prakash, Head, DPEP Core Resource Group and his team of dedicated faculty members processed the research papers and have brought them to their present shape. These efforts will enable us to disseminate the research findings to fellow researchers and practitioners through this publication which, it is hoped, will benefit researchers and teachers alike.

A.K. Sharma
Director
National Council of Educational
Research and Training

New Delhi
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Introduction

Majority of the primary schools in India are at best two-teacher schools beset with the problems of overcrowded classrooms. The teachers in such institutions invariably require newer strategies for organising the learning of pupils in a multigrade situation with institutional and community support. Moreover, the school and community interface needs a fresh look, and for that exchange of experiences and outcomes from other developed and developing countries may provide an impetus to the UEE in the country.

With this aim in view, the NCERT organised the Fourth International Seminar on Learning Organisation, Community Participation and School Effectiveness at Primary Stage from 15 to 17 July 1998 at New Delhi.

The seminar was conducted under the auspices of the District Primary Education Programme (DPEP) that aims at achieving universalisation of primary education.

Scholars from India and abroad participated in the deliberations of the seminar and presented their papers The key findings of the studies were discussed for suggesting changes and improvements in primary education in India.

It was decided that selected studies presented in the seminar might be published for wider dissemination and for all those Indian and foreign beneficiaries who could not attend the seminar.

This compendium of studies includes the studies presented by the authors during the seminar. The studies have been classified under eight themes. These include : (1) Learning Organisation and Cognitive Growth, (2) Learning Organisation in Multigrade/Multilevel Situations/Special Education, (3) Alternative Approaches to Curriculum, (4) Activity Based Classroom Transaction, (5) Management of Learning in Large-sized Classes, (6) School Climate and Effectiveness, (7) Community and School Management, (8) Community Participation and School Effectiveness.

Editor

Contributors

Mr John Shotton
CODE, Homerton College
University of Cambridge, Hills Road
Cambridge CB2 2PH
United Kingdom

Dr A.C. Pachaury
Reader in Education
Regional Institute of Education
Shyamla Hills
Bhopal 462 013

Dr T. Padmini
Reader
PG Department of Education
University of Mysore
Manasagangothri
Mysore 570 006

Dr Madhuri Mahapatra
Sr. Lecturer
Regional Institute of Education
Sachivalaya Marg
Bhubaneswar 751 007

Mr Peter Cam
Edu. and Trg. Specialist
Carl Bro Management
Granskoven 8
DK - 2600 Glostrup
Denmark

Mr N.S. Bhardwaj
Assistant Commissioner
Tribal Development
DPEP
Dhar
Madhya Pradesh 454 001

Mrs Kusum N. Kamat
301, Georgina 'A'
Sherley Rajan Road
Off Carter Road
Bandra (W)
Mumbai 400 050

Mr Andrew Burke
St Patrick's College
Dublin City University
Drumcondra, Dublin 9
Ireland

Dr Reeta Sharma
Regional Institute of Education
Shyamla Hills
Bhopal 462 013

Dr Baijayantimala Satapathy
District Institute of
Education and Training
Dhenkanal
Orissa 759 001

Dr K.K. Vashishtha
Professor and Head
Regional Institute of Education
Mysore 570 007

Mr V.S. Varma
Centre for Science
Education and Communication
10, Cavalry Lines
University of Delhi
Delhi 110 007

Dr Jaya Shankar Padhi
Reader in Education,
Regional Institute of Education
Sachivalaya Marg
Bhubaneswar 751 007

Dr N. Shankuntala Manay
69, Surveyor Street
Basavanagudi
Bangalore 560 004

Ms Neera Chopra
Principal
Naval Public School
Satya Marg, Chanakyapuri
New Delhi 110 021

Mr T. Mphuthi
Department of Educational Foundations
National University of Lesotho
Roma 180
Lesotho

Ms M. Sharda
Primary Teacher
Demonstration School
Regional Institute of Education
Mysore 570 006

Mr M.K. Satapathy
Regional Institute of Education
Bubaneswar 751 007

Mrs Pranati Panda
Sr. Lecturer
Department of Teacher
Education and Extension
NCERT
Sri Aurobindo Marg
New Delhi 110 016

Prof. Lynn Davies
Director
School of Education
University of Birmingham
Birmingham B15 2TT
United Kingdom

Mr P.K. Das
Regional Institute of Education
Bhubaneswar 751 007

Dr Haseen Taj
Department of Education
Bangalore University
Bangalore 560 056

Ms Elizabeth Mehta
Project Director
School Development Programme
Aga Khan Education Service
39/43, Nesbit Road
Mazagaon
Mumbai 400 010

Mr Bert P. Creemers
University of Groningen
P.O. Box 1286
9701 BG Groningen
The Netherlands

Dr N M. Rao
Reader in Mathematics
Regional Institute of Education
Mysore 570 006

Dr Satender Kumar
Reader in Education
Centre of Advanced
Study in Education
M.S. University of Baroda
Vadodara 390 002

Dr Mohd. Muzammil
Reader in Economics
Lucknow University
Lucknow 226 007

Dr K. Ganeswara Rao
Lecturer
DNR College of Education
Bhimavaram
Andhra Pradesh 534 202

Dr V.P. Gupta
Reader
Regional Institute of Education
Shyamla Hills
Bhopal 462 013

Smt T.V. Lalitha
Primary Teacher
Demonstration School
Regional Institute of Education
Mysore 570 006

Dr Premlata Sharma
Reader
Department of Education
Regional Institute of
Education
Mysore 570 006

Contents

FOREWORD v

INTRODUCTION vii

CONTRIBUTORS ix

Section I : Learning Organisation and Cognitive Growth 1

1. Teaching and Learning in Indian Primary Schools — Using Local Experience 2
John Shotton

2. Conceptual Strategies Employed by the Perceptually Decentering and Non-decentering Village School Children 20
A.C. Pachaury

3. The Influence of Culture on Cognitive Thinking — A Study of Socially Disadvantaged Girls of Mysore 33
T. Padmini

4. Strategies to Reorder and Restructure the Curriculum at Primary Stage 46
Madhuri Mahapatra

Section II : Learning Organisation in Special Education Multigrade/Multilevel Situations 61

5. Inclusive Education — A Path for the DPEP 62
Peter Gam

6. Multigrade Teaching in Small Schools 80
N.S. Bhardwaj : Aruna Boda

7. Management and Organization of Learning in Multilevel/ Multigrade Situations for School Effectiveness 98

Section III : Alternative Approaches to Curriculum 113

8. Back to Basics : Research Based Lessons for Effective School Learning in India 114
Andrew Burke

9. Functioning of Alternative Schools in DPEP Districts of Madhya Pradesh 130
Reeta Sharma : V.P. Gupta : V.P. Singh

10. Capturing the Process of Indigenous Rural Skills for Revamping the Pedagogy at Primary Level 141
Baijayantimala Satapathy

11. Achievement in Science and Mathematics as a Function of Learning Organization of Competencies in Mathematics at Primary Stage 153
K.K. Vasishtha : Krishna Kumar Madan

Section IV : Activity Based Class Transaction 169

12. The School Mathematics Project: Towards Freedom from Fear 170
V.S. Varma

13. Learning Subject Specific Concepts through Creative Activities 179
Jaya Shankar Padhi

14. Effect of Puzzle Programme in the Development of Cognitive and Creative Abilities among Pre-school Children 189
N. Shakuntala Manay : Shobha Rani T.C.

15. Activity Based Classroom Transaction : A Case Study 211
Neera Chopra

Section V : Community Participation and School Effectiveness 237

16. Community Participation and Resource Mobilisation for Educational Development of Minorities 238
Mohd. Muzzammil

17. A Study of the Relationship between Community Participation and School Effectiveness 248
K. Ganeswara Rao

Section VI : School Climate and Effectiveness 255

18. School Climate and Effectiveness in Contexts of Stringency 256
Lynn Davies

19. Role of NGO in UEE — A Case Study of Agragamme 269
P.K. Das : V.K. Sunwani

20. Teacher-Freezing: A Threat to School Effectiveness 277
Haseen Taj

21. A Tool for the Ongoing Participatory Road Mapping of the Organization Development of Educational Institutions 294
Elizabeth Mehta : E.R. Prasad

Section VII : Community and School Management 313

22. Effects and Costs of Community Participation: Results of the Primary Education Quality Improvement Project 314
Bert Creemers : Greetje Van der Werf

23. Combating School Dysfunctionality through Community Mobilization : Case Study of a Rural School 331
N.M. Rao

24. Community Participation in Primary Education and School Effectiveness 339
Satender Kumar : Ramesh C. Patel : Anjali K. Mehta

Section VIII : Management of Learning in Large-sized Classes 355

25 Learning Organization and the Effectiveness of Primary Education in Lesotho: A Case Study of Roma Primary Schools 356
T Mphuthi : O.A. Adeola

26. Activity Based Teaching Learning Strategies (ABTS) in a Large-sized Class at Primary Stage : A Study 370
M. Sharada

27. Teaching Environmental Studies in Large-sized Primary Classes: Evaluation of Some Practices 380
M. K. Satapathy

28. Instructional and Management Practices in Large-sized Classes. Reflections on Classroom Strategies 388
Pranati Panda

Poster Session: Community Participation and School Effectiveness 407

29. Learning Achievement of Children Studying in Alternative Schools of DPEP Districts of Madhya Pradesh 408
V.P. Gupta : Reeta Sharma ; V.P. Singh

30. Effectiveness of the Strategies in Developing Map-reading Skills in Large-sized Classes at Primary Stage — A Study 425
T.V.Lalitha

31. Enhancing Learning School Language of Disadvantaged Learners through the Use of Home Language in Multigrade Schools 433
Premlata Sharma

SECTION I

Learning Organisation and Cognitive Growth

The studies discussed in this section include.

- Teaching and Learning in Indian Primary Schools – Using Local Experience
- Conceptual Strategies Employed by the Perceptually Decentering and Non decentering Village School Children
- The Influence of Culture on Cognitive Thinking – A Study on Socially Disadvantaged Girls of Mysore
- Strategies to Reorder and Restructure the Curriculum at the Primary Stage

1

TEACHING AND LEARNING IN INDIAN PRIMARY SCHOOLS — USING LOCAL EXPERIENCE

John Shotton

The study was aimed at assessing the impact of contextualised teaching and learning on school 'attendance, on school performance, on development of school community links and on teacher 'pupil and parental attitudes. The study revealed that contextualising learning through the use of 'local experience might help to break down the barriers between the different learning 'environments and create conducive learning, thus enabling both girls and boys to learn more' effectively.

Introduction

There are five sections to this paper. In the first section, I outline the research context, giving some indication of the background to and purpose of the study. In the second section, I provide a more general context in terms of the state and funding of primary education in India. In the third section, I try to define what is meant by 'contextualisation'. In the fourth section, I lay out a summary of the actual research study. In the fifth section, I consider the implications of the research findings.

The Research Context

Background

The research behind this paper had two general sources the first was a series of observations and experiences in schools which have been embraced by District Primary Education Programme (DPEP) that I visited in the rural and urban areas of Andhra Pradesh, Himachal Pradesh, Karnataka and West Bengal between 1995 and 1997 where I was shown by teachers, VEC members and DPO staff that children who were being taught in a context that was familiar to them were both happier and higher achievers than their peers labouring in an alien context, the distinction between familiar and alien centering around the nature of the relationship of the children to teachers, teaching and learning materials and teaching methods. The second source was a desire to build on the base for research into the contextualisation of classroom processes provided by Berhanu Dibaba, George Malekela, Abigail Molihall, Padmini Ranaweere, C.Seshadri and Peter Taylor in their outstanding research study on the use of agricultural experience in contextualising learning in rural primary schools. (1997). Their work is an inspiration, but more practically they have designed a methodology for researching issues around curriculum contextualisation in the primary school classroom in countries of the South that is usable in most national contexts and in most types of school

The research questions which formed the basis for this study were rooted in the findings of an initial literature survey which set out to examine how local experience in a given slum or resettlement colony (the most educationally deprived urban areas often accommodating the most deprived SC urban communities) or rural area, that is community culture — history, folklore, personal biography and work practice and experience, could be used as a means of contextualising the primary school curriculum. The literature survey highlighted the following key issues which formed the basis for the research questions which I lay out in detail in Section Four of this paper:

- Relevance of the curriculum to the experience of Indian children is emerging an important issue although the debate is at a very early stage. It is being recognized that in many primary schools the curriculum is set at an inappropriate level and its origin stems from a cultural background that is far removed from that of the learners.
- By relating the content of the curriculum and subsequent teaching and learning strategies, to the life experience of the pu pils, it may be possible to make the Indian primary school more meaningful In rural areas, for example, agricultural experience can provide an ideal vehicle for contextualising learning in all subjects, including language, mathematics, science. environmental studies and health education. By

integrating the agricultural experience of individual pupils into their learning, it may be possible to link the learning environments of school, home and community.

- Some reports of developments at the primary level in India reveal that a number of States, and within some States a number of districts, have developed an integrated approach in the primary school curriculum, either State-wide as in Andhra Pradesh, or in a few pilot schools as in Kulu district in Himachal Pradesh. There are examples of textbooks and teaching and learning materials which draw on local experience when illustrating mathematical and scientific procedures, and also for language teaching.

- There seems to be a case for investigating the potential of local knowledge and experience in India to be used as a means of contextualising teaching and learning, and to examine the implications for curriculum development resource allocation, teacher training, assessment procedures and policy formation. In particular, there are implications for a certain decentralisation of decision-making. Some degree of responsibility for the way in which teaching and learning takes place would have to move from central planners, in the case of elementary education generally from the Department of Education to sub-district structures, and more specifically in the case of DPEP (I use DPEP as a reference point here and throughout this paper because it is probably the most important initiative in progress in elementary education in India) from the DPEP Bureau and its technical support, and the SPOs, and DPOs, to teachers and teachers and VECs in partnership, and again from these stakeholders to pupils. This will require commitment; support and vision from policy makers, teachers and managers, pupils and community members alike.

Purpose of the Field Research

Having completed the literature survey, the second phase of the research was to gather information about schools which have used local experience as a means of contextualising teaching and learning, and compare such schools with others lacking the approach. Thereafter, by looking at the implications for teaching and learning practices, resources, school management and teacher training, the intention was to evaluate the impact of successful contextualisation practice on school attendance, school performance, development of school-community links, and on teacher, pupil and parental attitudes. The study has no pretensions to being in any way quantitative. Case studies were used to examine the capacity of local experience to act as a familiar vehicle for the development of young learners, basic skills of literacy, numeracy and other life-skills which are perceived as necessary for a fruitful and productive life and to triangulate the data gained. The intention was to produce a snapshot of successful practice, drawing out lessons where obvious and appropriate

Outcomes

The research has yielded policy suggestions for future interventions in primary education in India based on the findings of the literature survey and the case studies. It could provide guidelines for planners and practitioners relating to the ways and means of integrating local experience and knowledge into the elementary/basic education programmes, in order to maximise the benefits identified whilst at the same time minimising the constraints that are likely to arise. The outcomes of the research should be of particular value to decision makers at the national level when planning the overall structure of their elementary education programmes, and to donors as a guide to policy decisions relating to educational funding.

Primary Schooling in India

In 1990, at the World Conference on Education for All in Jomtien, Thailand, a declaration was adopted to reaffirm the international community's commitment to ensuring the right to education for all people (UNESCO, 1996) ·

> *"Every person —child, youth and adult —shall be able to benefit from educational opportunities designed to meet their basic learning needs."*

This declaration was made in response to international concern over the deterioration of education systems in previous years. In 1995, an estimated 885 million adults world-wide aged fifteen plus) were illiterate and 100 million children were out of school. However, these figures have proved to be an extremely conservative estimate, and in India alone, as Vinod Raina has suggested (1998), there are probably 100 million Indian children who are out of school. Given that there are 200 million 6-14 year-old in India, this then means that for the Jomtien declaration to have any real effect in India the elementary school system will need to be funded and expanded by 100%.

As education is a concurrent subject under India's Constitution, its financing is the shared responsibility of the Central and State governments. About 90% of such funding comes from the States and only about 10% from the Centre. Even though the Constitution talks of free elementary education, households have a major share in expenditure. Thus, State governments, households and the Central government, in that order, are the main contributors to elementary education State expenditures as a share of GDP vary considerably. In 1992-93, State education spending ranged from 3.0 to 7.5% of domestic product in the major States.(Raina, 1998) Within this, salaries accounted for 97% of the expenditure with only 0.18% being spent on books and equipment.

As far as the Central government is concerned, although its expenditure on education is only a comparatively small amount, it is of strategic significance in that it is used to fund new and innovative programmes such as Operation Blackboard. Currently, the Government of India is borrowing funds and accessing grants to increase such programmes and it is as a result of such funding that DPEP has emerged.

DPEP promises a major shift in educational planning, with districts preparing their own primary education plans with funds being released after appraisal. Early indications are that this decentralized planning has led to far more locally planned and contextualised curriculum development and teacher training. (Raina, 1998) Inevitably, given the fact that the programme is a Central government initiative there is a national agenda, but as the programme enters its fourth year there is evidence that decentralised planning is leading to diversity of approach in a number of critically areas, particularly curriculum development, teaching and learning material development and teacher training. Across these three areas there is also evidence that contextualisation is emerging as a major issue.

Considering Contextualisation

Educationists have for many years been thinking about how the way in which children learn in school can be related to their environment. Gulliford and Widlake (1975) quoted John Dewey saying that

> *"...Children are people. They grow into tomorrow only as they live today."*

More recently, Bloom (1992) noted that :

> *"...children's . personal experiences, emotions, metaphors, interpretive frameworks, and so forth serve to create a complex system of processes that affect the nature of their personal knowledge and how it is constructed."*

From this perspective, the educational development of a child is inseparable from the being which the child has become, brought about through a complex history of social interactions and relat ed to the context in which the child has been raised. As children develop, they continue to construct their own being, and educa tion as an experience can affect and contribute to this process. Such a discourse has challenged the Piagetian emphasis on indi vidual cognitive development and has huge implications for the expansion of primary education in Southern countries which have often been wedded to Piaget.

The argument of the 'contextualists' is that children see the world holistically, that is they make meaning of their surround ings by making connections. Learning takes place through the introduction of new information which meets the prior knowledge and experiences of the leaners. Learners come to school with knowledge from their home, friends, environment and radio. This knowledge is not necessarily broken up into maths, mother tongue, natural science, social studies and health education. They come with knowledge and experiences that have meaning to them. If one accepts this, in order to help children to learn new concepts and processes it is important to make connections to the knowledge that they already have. Contextualisation can achieve the difficult task of linking 'school knowledge' and 'home knowledge'. Indeed, the Report of the National Advisory Committee of India (1993), gives an example:

> *"One class teacher who tried to make such a bridge in a lesson about letter writing was asked by a Class IV child: 'Madam, shall we write it the way we write it at home or in the school way?' "*

The report goes on to state,

> *"This kind of perception results in the confinement of classroom*

> *life to a narrow orbit. Classroom knowledge assumes total independence from the child's own experience and knowledge of the world. As a consequence of this de-coupling, children begin to compartmentalize knowledge into two categories: that which has currency in the school and classroom, and the other which has uses and relevance outside the school."*

An aim of the contextualisation is to put an end to this de-coupling by de-compartmentalising knowledge, and allowing all those involved in the learning process to recognize that learning is in fact a common currency to all learning environments. The key question though is "Does it work"?

The Research Study

The Research Questions

Based on the aims of the purpose of the field research and the leading question posed at the end of the last section, the main research question was developed as follows

- What can be learned from primary schools in India that have attempted to use local experience as a means of contextualising teaching and learning?

This main question was then subdivided into a series of specific research questions·

- What practices have teachers developed and used in order to contextualise teaching and learning?
- What are the existing levels of knowledge, skill and attitude amongst teachers towards the process of contextualisation?
- What are the attitudes of learners, community members and policy makers towards contextualisation?
- What evidence is there to suggest that teachers use local experience as a means of contextualising teaching and learning?
- What factors enhance or constrain the use of local experience as a means of contextualising teaching and learning?
- What is the impact of contextualisation of the process of teaching and learning?
- What is the role of contextualisation in strengthening and

developing linkages between the school, home and community environments?

- What are the implications of contextualisation for educational planning and practice in the future?

The Research Methodology

The methodology was designed specifically for this research to find answers to the research questions detailed above. However, I must acknowledge that the basis for the design was that developed by Berhanu et al (1977). It proved through the use of a qualitative, triangulated approach to be very successful in meeting the aims of the research. The selection of the schools for study was made entirely on the basis of personal knowledge

Designing the methodology was a long process and required modifications before and during the field work. The process started with the design of a table that detailed the key issues identified from the research questions), methods of data collection, potential sources of data and the type of data to collect in order to obtain information on the issues. Following this, eight case studies were carried out, these were located in two primary schools in each of the four states. Field work of one week in each school was undertaken in order to obtain an understanding of the particular school in relation to the key issues The schools were selected accorded to a set of guidelines, the most important being as follows :

- One case-study school was recognised as a 'progressive' school, the school being perceived as progressive where it conforms to some or all of the following

1. there is a degree of flexibility in the curriculum, either in the basic construction or in the way the teacher interprets it and teaches it;
2. children are encouraged and able to discuss issues in class;
3. some attempt is made to use children's out-of-school experience in the learning process;
4. teachers use and/or develop resources based around children's out-of- school experience and knowledge.
5. there is some degree of continuous assessment;
6. parents and community members have some involvement with the school;
7. there is an attempt to use local technology in teaching and

learning resources relevant to the local community and easily obtainable).

8 there is some degree of integration of subject matter across the curriculum.

9. there is some evidence of teacher support;

10. there is evidence of some decentralisation and of school-based planning.

(**Note**: The four schools selected were all schools where the teachers had received training as a result of DPEP).

- The second school was in the same vicinity as the first, but did not necessarily need to have a reputation for progressivism.
- Brief overviews of two more elementary schools were under taken through one- day visits, in order to provide more supporting data for the case studies.

(**Note:** The twelve schools selected were all 'non-DPEP schools'.)

In the schools, data collection was through informal, semi-structured interviews and three participatory activities, namely, order ranking, matrix ranking and mapping. Separate questionnaires were constructed for the head teacher, teachers, pupils (group interviews of 6-8 per group) and community members (group interviews of 4-6 per group) Matrix ranking, which involved ranking ten methods of learning against each other by preference, was undertaken by pupils and teachers. Pupils also completed mapping diagrams, a drawing activity that was designed to illustrate what pupils did at home, what pupils did at school and whether there were any learning connections between the two environments. Classroom observations along with the participatory activities, provided supporting evidence to the interviews and more information on the teaching and learning processes in the schools.

Semi-structured interviews were held with key informants (policy makers, educationalists and researchers) to obtain their views. Appropriate literature and reports were also consulted to provide background information on the national, regional and local contexts of the school.

Summary of the Case Studies

Andhra Pradesh

Andhra Pradesh is a huge State with great variations and divide in culture, language, caste religion and gender, both between and within districts. The immense population, the majority of whom live in rural areas, the uneven development, and the striking differences between the urban and rural populations, create an infinite and ever changing task for the State's education development. Although enrolment is relatively high in comparison to other States in India, drop-out rates are also high and achievement levels are low. Over half of the population is illiterate and the large disparity between sexes results in a high level of female illiteracy.

In the case studies, generally, teachers, parents and pupils agreed that learning is easier when out-of -school experience is used and related to what is taught in school through the formal curriculum. All agreed that it helps them understand things better, apply knowledge in practical daily life situations and see the relationship between knowledge from school and real life situations. Teachers confessed they do not practise this pedagogy for a number of reasons. With the exception of three teachers in School A who have been trained under DPEP they are unhappy with the training they received and feel that more support in this area would enable them to try out progressive teaching methods such as contextualising teaching and learning. They do not have the necessary skills to relate school knowledge to the daily life experience of pupils because this was not covered in their training.

At present schools have almost no input in curriculum development as responsibility resides at the State level. The curriculum is not relevant to the lives of pupils and there are many teaching and learning areas that cannot be related to practical, concrete real-life situations. The majority of teachers felt they can do little to improve their teaching practices, considering the lack of facilities and harsh conditions they work under. The rigid structure of the timetable, pressure on them to cover the curriculum according to a prescribed plan and the narrow requirements of the assessment system allow them little flexibility to adopt progressive teaching methods. Teachers find it easier and feel more secure if they teach through books, which does not require great effort or creative, imaginative planning of the learning experiences necessary for progressive teaching.

More specifically, in terms of initial impressions of the two schools studied in detail, there was a distinct difference. School A, the progressive school, is well maintained and attractive to look at. On the other hand, School B is hardly recognizable as a school from the outside as it has no boundary wall and appears run down and neglected. The atmosphere in the two schools again was notably different. Pupils appear happy and enthusiastic in School A; in school B they are passive and shy. In School A, three teachers trained under DPEP, including the head teacher, revealed that they used the Rs. 500 grant, a sum given to all teachers under DPEP, to purchase relevant local materials. For example, the head teacher indicated that he used a role play game to teach numeracy to Class II pupils involving the buying and selling of local vegetables and fruit. Pupils were required to bring in vegetables and fruit but many could not afford this. The grant was used for this.

Even from this small case study it is evident that co-operation between the head teacher, teachers, and community members is vital in forming a supportive learning environment for the pupil. The field work illustrated that teachers', parents', community members' and pupils' perceptions of education and their views on knowledge are important factors in using a contextualised approach to teaching and learning.

In random tests conducted in language and mathematics with Class II pupils in Schools A and B, it is revealing that generally the pupils in School A outperformed those in School B by 70%. Although one cannot attribute this entirely to the contextualisation of the curriculum, it has to be noted that one major difference between the two classes was local experience as a knowledge base in School A and development by the teacher of village-relevant teaching and learning materials.

Himachal Pradesh

Himachal Pradesh faces enormous problems in all areas of social policy largely because of the remote nature of many parts of the State. However, elementary education, and within it primary education, have had a high profile in Himachal Pradesh since Independence. The State has been the second highest spender on elementary education in all of India and has made concerted efforts to improve the quality of education generally, and a high literacy rate and low drop-out rate from elementary school are among some of the State's achievements. However, despite these and many other high achievements, the problem of remoteness and difficulty of access to rural primary schools, especially in mountainous areas, still remains an unresolved problem.

In the case studies, teachers, especially, liked the idea of contextualisation The benefit of having "an image in the eye" when learning, was mentioned on several occasions. Similarly, parents appreciated the idea of linking schooling to the home environment, as long as intimate details and confidentialities are not betrayed. Children described the learning process at home as easier than that at school because there is the absence of pressure from time, and because they are not called upon to deal with complex, abstract concepts.

The benefits of contextualisation are borne out in the retention rate and achievement levels of pupils in Schools A and B. Generally, retention rates in School A were 40% higher than those in School B. In School A the Class II teacher had received three weeks' training under the DPEP programme and had been encouraged to develop 'locally relevant' teaching and learning materials. School A is in the mountains, two miles from a road, and the teacher has worked with members of the VEC to produce teaching and learning materials for language development that the children will recognise, for example models of local gods that take on a particular significance at Dussehra and Diwali, and pulses from the fields. School B is also in the mountains but the only teaching and learning materials available are the textbook and a range of 'standard' products — wall chart, model of the Taj Mahal and pictures of national leaders. In the same random tests as conducted in Andhra Pradesh, pupils in School A out performed those in School B by 81%.

Karnataka

Karnataka has seen many changes and developments in its educational provision in recent years but if one looks at the progress since 1981, there has been a decline in the proportion of children completing eight years of schooling The reasons for this are complex but as the DPEP baseline assessments suggest the scale of the problem of retaining children in Classes II to IV is considerable in three of the State's districts.

Having said that, there is a commitment in the State to centre primary school development around the aim of cultivating the individual's capacity for problem-solving and adaptability to the environment by developing the necessary knowledge, ability, skills and attitudes. This seems to be reflected in the teacher training programmes that are being developed in some DIETs in the State.

However, in the case studies there was little evidence to suggest that teachers knowingly contextualise their teaching and practices.

When interviewed the reasons included a general lack of resources, time constraints, overcrowded classrooms, and poor teacher training that does not prepare teachers for using innovative teaching methods or for making use of local resources in their teaching practices.

During field work, discussions with teachers revealed a keen interest to know more about the idea of contextualising teaching and learning. As a process it was not one they were familiar with, but there was a consensus that it would be quite easy for them to practise it because of pupils' familiarity with the local environment.

In School A, teachers were trying hard to make learning relevant to pupils. The school is in a resettlement colony in an urban area undergoing a major land-clearing programme, and during interview with the pupils they were able to easily identify areas where local experience had been brought into subject-areas. The most frequent example given was measuring land in a maths lesson.

In the same random tests used in Andhra Pradesh, and Himachal Pradesh, conducted with Class II pupils in Schools A and B the results were very much the same but at a much lower level than the results in the previous States. One could tentatively suggest that this was in part due to the quality of teacher training.

West Bengal

The findings of the research in West Bengal indicate that a very large gap exists between the plans made by educational policy makers and curriculum developers at the State level and the reality of life in the schools, on the other Problems exist in both urban and rural schools, some of which are very similar, such as dilapidated buildings and a lack of equipment, and others which are more area-specific. Urban schools tend to have much larger class sizes, in some cases of up to 150 pupils. Rural schools still suffer from large class sizes but not to the same degree. On the other hand, rural schools suffer because their development depends largely on parental contributions which often parents would rather spend on private schooling.

However, despite this and also despite the fact that DPEP has been slow to operationalise in West Bengal there were encouraging signs in School A where one teacher in Class I was clearly familiar with the concept of contextualisation. She had tried to contextualise her whole approach to basic literacy and numeracy by using local agricultural experience and knowledge. When interviewed, the teacher suggested that the implementation of ideas and concepts involving agriculture — for example, stories about agriculture for language work and use of local vegetables for number work — were taken up with more and greater interest by the children. Generally, parents were agreeable to such an approach They also appreciated their children telling them about their school work, particularly if they also gained something from their children's schooling, for example, new agricultural techniques or practices to improve health.

Interestingly, the VEC in Village A meets every week, which would seem to indicate a strong community feeling for the school with strong parental likes and involvement. Further, the retention rates of children in School A are double that of those in School B and the two other schools where case studies were conducted.

Random tests were conducted with Class I children in Schools A and B, with children in School A outperforming the children in School B by 150%. However, the comparison is in many ways grossly unfair as there were 51 children enrolled in Class I in School A and 134 in School B. There are, though, some lessons to be learned about community involvement from the more general experiences in School A.

Issues and Implications Arising from the Research

In Section Four, summaries of the main conclusions of the case studies have indicated key areas of importance which emerged during the research, both in terms of general issues relating to primary education in both urban and rural areas, and some specific issues relating to contextualisation of teaching and learning. In this final section, I try to highlight some of the most critical issues, and discuss some implications of contextualising teaching and learning which arise from the literature and from the field research.

Issues

Teachers and Contextualisation

The most common pedagogical approach used in primary schools in India is still chalk-and-talk When chalk or a blackboard are not available, the result is even more teacher-talk. Pupils in the 'non-progressive' schools visited in this research were rarely required to participate actively in lessons. However, there is evidence from the literature and the field research that in some schools where teachers have been trained in DPEP the teachers are beginning to attempt to contextualise learning by relating the content of the curriculum to the experience of their pupils. This is generally achieved by using examples with which pupils are thought to be familiar.

The views expressed by teachers through interviews and ranking exercises suggest that they appreciate the value of contextualising teaching and learning, particularly in relation to improving attendance and learning achievement, and would like to learn more about it.

On several occasions teachers stated that they had learned a lot from being involved in the research process and would even use some of the methods developed to gather information in their own teaching. This would seem to indicate the importance of encouraging teachers themselves to become involved in research.

Evidence of the Use of Local Experience as a Vehicle for Curriculum Development

In both rural and urban schools, local experience and materials from the local environment are utilised by some teachers in India as the basis for teaching and learning

The literature survey reveals that this is usually the result of an innovative teacher training programme. The case studies reveal some examples where pupils bring in agricultural materials such as plants and seeds, or foodstuffs, which are then used to illustrate abstract concepts. This technique was found to be most commonly used in mathematics teaching and there would seem to be evidence that this has enhanced learning achievement.

Factors Influencing the Use of Local Experience in Curriculum Development

The research has revealed a number of factors which seem to influence the use of local experience as a means of contextualising teaching. Firstly, support for teachers seems crucial. This may come from the head teacher, from pupils, from other teachers, parents, policy makers and schools advisers or inspectors. Donor support, as in the case of Andhra Pradesh where the British Government's Department for International Development has encouraged the development of a contextualised teacher training programme, or recognition as a model or pilot school as in the case of Himachal Pradesh which has developed model schools linked to DIETs, does seem to raise the prestige of the school in the locality. This in turn seems to be a motivating factor for teachers and pupils, and encourages community members and parents to be more supportive of the school and its activities.

Attitudes of Stakeholders to Contextualisation

Just as the teachers favour the process of contextualising teaching and learning, those pupils, community members and policy makers who were interviewed seem also to think that it is a practice worth utilising and would like to explore its potential Many respondents stressed how important it is to base new learning on what is known already.

The Role of Contextualisation in Developing Community Involvement in Education

Most research on primary education in developing countries suggest that the learner can play a vital role in strengthening linkages between the three learning environments of the school, the home and the community. Contextualisation can, in theory, enable the learner to link the learning experiences in these three environments. The teacher, by contextualising teaching and learning, can facilitate this process From the research findings, it becomes clear that this does happen

Implications and Conditions Necessary to Support the Contextualisation of Teaching and Learning

Certain conditions in primary schools in India make innovative approaches to teaching and learning difficult to introduce. The most crucial appear to be :

- large class sizes;
- too many short lesson periods per day, each allocated to a different discipline;
- lack of basic materials for teaching aid development;
- lack of support by schools inspectors and teacher trainers who fail to visit schools, or try to enforce traditional practices which are inappropriate:
- lack of inservice training and support which could free teachers, mentally, to experiment;
- poor motivation of teachers;

- increasing numbers of young teachers entering teaching who would prefer to be doing something else and are incapable of teaching large sections of the curriculum;
- inflexible centralised curriculum development and modes of assessment

Certain conditions do support the use of contextualised teaching and learning in rural primary schools, particularly.

- enthusiasm of teachers to do the best for their pupils,
- enthusiasm of pupils to perform well;
- enthusiasm and support of many parents for schooling, especially from those who have themselves received an education (there was a lot of evidence of the part that Total Literacy Campaigns have played in encouraging women, especially, to send their children to school);
- a willingness amongst parents to encourage their children to discuss their schooling, and to offer help with problems, and recognition of their achievements in school;
- the supportive nature of teachers towards each other.
- the close relationship between many rural schools and the surrounding community;
- the vast resource base surrounding all schools;
- the real demand from all parties for teachers to be provided with professional development in terms of pre and inservice teacher training;
- teachers who hail from the community in which the school is located;
- the presence of teachers in the school who have a knowledge and understanding of the use of local experience as a vehicle for curriculum development and pedagogical renewal;
- space available in the school for local experience-based activities.

Teacher training and support is a critical factor if the process of contextualisation is to be adopted in rural and urban primary schools. Teachers need to reflect on their pedagogical practices, and to question their attitudes towards real learning. Many teachers do use a range of excellent practices on a daily basis, but they may not be aware that they are in fact doing this. Awareness of successful approaches to teaching and learning will certainly contribute to the development of more innovative strategies. Finally, if teachers, pupils and community members can develop a view of education as good in itself, then there is a far greater chance of building a learning environment which has a chance of achieving real success.

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2

CONCEPTUAL STRATEGIES EMPLOYED BY THE PERCEPTUALLY DECENTERING AND NON-DECENTERING VILLAGE SCHOOL CHILDREN

A.C. Pachaury

The purpose of the study was to explore conceptual strategies employed by the perceptually decentering and non-decentering village schoolchildren The study revealed that children of grade three through grade five formed a homogenous group in respect of perceptually decentering behaviour supporting the view that the sampled village schools did not care to develop and nurture perceptual decentering behaviour in their students. Further, the study found that the children utilized their past experiences to deal with the un-learnt situations quite well indicating that they possessed the necessary competence to think conceptually. This trait ought to be nurtured through schooling.

Introduction

The universalization of elementary education as envisaged through the District Primary Education Programme (DPEP) has three major goals. Besides enrolment and retention drives, DPEP lays emphasis as well on the quality of education. Assessment and nurture of conceptual thinking in village school children, therefore, is looked upon as a forward step in developing this ability of the disadvantaged students, because 'learning is not simply a matter of adding to and extending concepts" (Johnston, 1996). Hence, learning demands transformation and/or radical reorganisation of the existing ideas of the learners by employing varied conceptual strategies.

Visual perceptions form the raw materials for much of the conceptual thinking as well as for the construction of knowledge by human beings. What kind of the conceptual thinking an individual employs depends on the level of his cognitive development and his past experiences. Construction of meaning(s), therefore, results due to the interaction of the learner with the environment. The knowing processes have been variously named by the researchers. A conceptual strategy is defined as "an individuals spontaneous predisposition to perceive in a characteristic fashion" (Mahlois, 1990).

The importance of conceptual thinking for classroom learning cannot be easily dismissed; its utility has been aptly stated by Shulman (1987) as "the process of pedagogical reasoning and action" in teaching The Indian teacher educators by and large, display poor "pedagogical content knowledge" (Pachaury, 1997); therefore, they fail to offer "a rational structure for a story programme and teaching method" (Pinard and Laurendeau, 1970). Consequently, the classroom instruction fails to accommodate "the conceptual repertoire of the children" (Almy, 1966) It has been also argued by Saracho (1990) that conceptual thinking/cognitive styles help children in learning "different subject matter areas, as well as in the nurture of the student-teacher interactions in the classrooms".

Kagan et al. (1963, 1964), and Kagan and Kagan (1970) have developed a conceptualization test that measures three intellectual preferences of children, i.e., the functional, the analytic, and the categorical, Of these three, the functional mode is less mature, while the analytic mode "requires more mental differentiation and abstraction of parts from wholes" (Kogan and Saarin; 1990). Wolisnsky (1965), therefore, stressed that "incorporation of past experiences is a higher level of process which is not involved in perceptual activity." For Piaget (1952), thought is perceptual restructuring, i.e., "the whole is not reducible to the sum of its parts". The categorical mode is considered as conceptual functioning superior to either the functional and/or the analytic one by Gardener and Schoen (1962). Therefore, it is opined that conceptual thinking, as maintained by the authors, is essentially a hierarchical thought process.

"Perception is an act of categorization," stressed Burner (1964). It is, in fact, a basic cognitive process, that humans (sub-human species too) utilize in organising their past experiences through the process of decentering their thought. Piaget's theory (1952) of cognitive development espouses that the conceptual thinking of the child differs qualitatively due to progressive differentiations and integration of mental structures. The chief characteristic of the concrete operational child (7-11/12 years) is "his ability to descender from a focus on the perceptually dominant to an emphasis on the more invariant but less silent properties of stimulus displays" (Whiteman, 1967). Elkind and Scott, (1962) study supported the Piagetian theory of non-decentering of perception by the children of early childhood age, and "gradually decentering with age". In another study Elking et al (1964) found that "children from four to nine years of age with drawings containing parts and wholes maintained independent meanings". Ausubel (1964) has argued that the disadvantaged children show poor perceptual discrimination skills.

No two children come to the school with isomorphic past experiences and levels of cognitive functioning. Hence, they employ different levels of conceptual strategies in negotiating a perceptual and/or a cognitive task A major purpose of classroom instruction for the primary schoolchildren is not to goad them with the declared subject matter factual information, but instead, to free them from perceptual domination in processing information. This condition of the classroom instruction would undoubtedly help the students in utilizing the already learnt materials in context-independent situations (Pachaury, 1996) Children display considerable variation in the use of the conceptual strategies Therefore, keeping in view the role of : (a) part-whole discriminations in perceptally decentering ability, and (b) conceptual strategies employed in processing of information, it was considered desirable to explore conceptual strategies employed by the perceptually decentering and non-decentering village school children. Specifically, the following research questions have been addressed through this study

1. Does there exist a developmental progression in the ability of perceptual decentering of the village schoolchildren of third through fifth grades?
2. Do the village schoolchildren of third through fifth grades, who are perceptually decentering employ more number of times the functional, the analytic, and the categorical strategies than their perceptual non-decentering peers?
3. Is the ability to employ different levels of conceptual strategies affected by the gender of these samples Ss?

Sample

Fifteen boys and fifteen girls at each grade of third through fifth were randomly selected from five lab-area village schools of a DIET of Madhya Pradesh. These Ss had ages of 9+, 10+ and 11+, respectively, seventy nine Ss had completed all the tasks administered to them.

Method

The semi-clinical method of data collection were employed by the author.

Task Administered

The perceptual decentering tasks (Elkind, 1962;1964) and the conceptual strategies tasks (Faw and Belkins, 1989) were administered to all the sampled Ss. Each subject took about ten minutes to complete the tasks

Elkind's tasks were used as a criterion measure to bifurcate the Ss into perceptually decentering and non-decentering categories. Ss whose perceptual regulation was hinged at 'parts' only were designated as 'non-decenters', and the Ss who utilized either 'wholistic' and/or 'part-whole in combination' were categorized as 'perceptually decenters'.

The conceptualization tasks were scored for the functional, the analytic and the categorical strategies suggested by its designers (Faw and Belkings, 1989).

Statistical Treatment

In order to determine whether there exists any significant difference between the percentages, the Omega statistic (W) was calculated with Alpha fixed at 5% level of confidence (Downite and Heath, 1965).

Results

Developmental Progression of Perceptual Decentralisation

Table 1 presents the percentages of the village schoolchildren across the grades and gender displaying the behaviour of perceptual decentering and non-decentering.

The percentages for decentering behaviour ranged from 14 to 28 for either gender across the three grades. These percentages are quite low when judged against the 75% criterion fixed by Piaget (1952) as an index of development of decentering behaviour. Although Table 1 reveals that the perceptual decentering ability of the sampled boys had been better than that of their girl peers (IV/V grades), yet there does not exist any significant difference between the percentages of the boys and the girls of these grades; since none of the obtained value of the Omega statistic (W) reached the 5% level of significance (all the W.s'p> 05). However, it is obvious from this table that there exists a clear progression on perceptually decentering ability for the sampled village school Ss (32%-III; 41%-IV, 48%-V).

TABLE 1
Percentage of the Subjects Attaining Perpetual Decentration and Non-decenteration

Grade	*Decenters*			*Non-decenters*			
	Boys	*Girls*	*Total*	*Boys*	*Girls*	*Total*	*n*
3	16 00 04	16 00 04	32.00 08	40.00 10	28.00 07	68.00 17	25
4	27 58 08	13 79 04	41 37 12	27.58 08	31.03 09	58.62 17	29
5	28 00 07	20 00 05	48.00 12	24.00 06	28.00 07	52 00 13	25

Grade	*Boys*	*Girls*	*Critical*	*Obtained*	*n*
3	16.00	16 00	0 98	—	—
4	27.58	13.70	0.85	0.11	ns
5	28.00	20.00	0.81	0.06	ns

Contrast pair (Decenters)	*Critical ω*	*Obtained ω*	*n*
3B 4B	0.85	0.09	—
3B 5B	0.87	0.09	ns
4B 5B	0.71	—	—
3G 4G	0.98	0.01	ns
3G 5G	0.93	0.04	ns
4G 5G	0 93	0.06	ns

Elkind's (1964) research confirmed that decentering behaviour in children develops by the age of nine (75%). Against this empirical observation, the present sampled village schoolchildren show delay of at least three to five years in the development of perceptually decentering behaviour.

Two other interesting observations related to this behaviour of children are :

- There does not exist any significant difference between the percentages of the perceptually decentering boys-boys and girls-girls across the three studied grades of the village schools, since none of the obtained values of Omega reached the 5% level of significance (p>.05).
- It is true as well that there does not exist any significant difference between the percentages of the contrasting grade pairs (III-IV;III-V; IV-V) of perceptually decentering, and non-decentering Ss, and between perceptually decentering and non-decentering Ss across the grades (p>.05) (Table 2).

TABLE 2

Significant Differences between the Percentages of the Subjects across the Grades Who Attained Decenteration and Non-decenteration

Grade Pair	*%*	*Critical ω*	*Obtained ω*	*p*	*Decenters/ Non-Decenters (D) (ND)*
Decenters					
III-IV	32.00				
	41.37	0.63	0.06	ns	III D 32.00
III-V	32.00				ND 68.00 0.59 0.24ns
	48.00	0.63	0.09	ns	IV D 41.37
IV-V	41.37				ND 58.62 0.52 0.11ns
	48.00	0.56	0.07	ns	VD 48.00
Non-Decenters					ND 52.00 0.55 0.04ns
III-IV	68.00				
	58.62	0.47	0.05	ns	
III-V	68.00				
	52.00	0.51	0.04	ns	
IV-V	58.62				
	52.00	0.51	0.01	ns	

Hence, they form a homogeneous group in respect of perceptually decentering behaviour. These observations support the view that the sampled village schools did not care to develop and nurture perceptual decentering behaviour in their students.

Use of Conceptual Strategies

Table 3 represents the percentages reached by the perceptually decentering and non-decentering children in employing the three conceptual strategies.

TABLE 3
Percentages Reached by the Decenters and Non-decenters on Different Conceptual Strategies

		Decenters					Non-decenters			
Grade/ gender	*n*	*Functional*	*Analytic*	*Categorical*	*No. Response*	*n*	*Functional*	*Analytic*	*Categorical*	*No Response*
3										
Boys	4	12 50	25 00	62 50	—	10	05.00	25 00	30.00	40 00
Girls	4	—	37 50	50.00	12.50	7	14.28	21 42	35.71	28.57
4										
Boys	8	12 50	12 50	31.25	43.75	8	12 50	31.25	43.75	12.50
Girls	4	37 50	50 00	—	12.50	9	11.11	16.66	44 44	27.77
5										
Boys	7	35.71	42 85	21 42	—	6	16.66	33 33	41.66	—
Girls	5	30.00	20 00	50 00	—	7	16 66	50.00	35.71	—

The percentages of the functional strategy varied from 13 to 38 (decenters) and from 5 to 17 (non-decenters). For the analytic strategy, the percentages varied from 13 to 50 and 17 to 50, respectively while for the categorical strategy, the percentages were 21 to 63 and 30 to 45, respectively. No response percentages were quite high for the non-descender third-graders (29 and 40), and for fourth-grade decenters/non-decenters the percentages were 13 to 44. None of the Ss of the fifth-grade of either category refrained from responding to the conceptual strategies tasks.

On the basis of the obtained values of the Omega statistic (W), the following inferences have been drawn regarding the utilization of the three conceptual strategies by the sampled village school Ss who were perceptually decenters and non-decenters.

- There does not exist any significant difference between the percentages across grades for the decentering and non-decentering boys and girls on any of the three strategies employed by them (p> 05) (Table 4).

- There does not exist any significant difference between the percentages across grades for the decentering and non-decentering boys/girls on the categorical-analytic; the categorical-functional, and the analytic-functional pairs of conceptual strategies employed by them (p>.05)

TABLE 4

Gender Differences on Conceptual Strategies Employed by the Sampled Subjects

	Decenters				**Non-decenters**			
Grade	*Critical ω*	*Functional (fun)*	*Analytic (an)*	*Categorical (cat)*	*Critical ω*	*Functional (fun)*	*Analytic (an)*	*Categorical (cat)*
III								
Boys								
Girls	0.98	—	0.08	0.07	0.68	0.24	0.03	0.04
IV								
Boys								
Girls	0.85	—	0.18	0.26	—	0.67	0.01	0.11 —
V								
Boys								
Girls	0.81	0.03	0.16	0.10	0.77	0.03	0.11	0.04
	cat-an	cat-fun	an fun		cat-an	cat-fun	an fun	
III								
Boys	0.08	0.24	0.34	0.10	0.62	0.04	0.21	0.10
Girls	0.08	0.06	—	—	0.74	0.10	0.15	0.05
IV								
Boys	0.69	0.12	0.12	—	0.60	0.04	0.21	0.12
Girls	0.98	—	—	0.06	0.05	0.18	0.23	0.24
V								
Boys	0.74	0.15	0.11	0.04	0.80	0.04	0.10	0.12
Girls	0.87	0.10	0.12	0.04	0.74	0.07	0.16	0.24

At the ω are insignificant at 5% level of confidence

On these observations it is opined that the sampled rural schoolchildren of either category have employed similar strategies without any distinction in terms of the levels of processing of information encountered in the administered conceptual-strategies tasks. Implicitly, it is also reasoned that the classroom instruction of these village schools had done nothing for promotion of the conceptual thinking of their students. Rather, whatever levels of strategies had been employed by these children were their own spontaneous creation in response to task exposure

A chief goal of school learning is to exploit past experiences for hierarchical integration of ideas by employing conceptual thinking (Ausubel, 1964; Bruner, 1964: de Bono 1978; Gagne, 1965). The sampled village schoolchildren had utilized their past experiences to deal with the un-learnt situations quite well. This means they possess the necessary competence to think conceptually —which needs to be nurtured through schooling

Secondary Analyses

Nine primary school teachers as well as were randomly (4 male and 5 female) selected from the sampled village schools, and were administered the two sets of the tasks.

The percentages of non-decenters was 44.56% of these teachers were perceptually decenters. The maximum percentages for these two categories of the school Ss were 52.00 and 48.00, respectively. The differences in these percentages are not at all very much marked (p>.05); 44% of these teachers employed the higher-order conceptual strategy of the categorical type. For the functional, and the analytic strategies used, the percentages were 22 and 33, respectively. To ascertain whether there exists any significant difference in the percentages of these three levels of strategies, the Omega statistic yielded insignificant values (p>.05).

It is interesting to note that, percent-wise, the primary school teachers' performance on the use of the categorical strategy had been in no way better than the maximum percentage attained on this strategy by either the perceptually decentering or non-decentering village school children of third through fifth grades (teachers 44%; children decenters 63% and non-decenters 44%). This empirical fact raises a serious concern about these teachers' classroom transactional styles for the development and nurture of the conceptual thinking of their students. This view is sustained by Wig and Somel's (1980) opinion that "cause effect relationships appear to be influenced by visual perceptual deficits and by delays in learning the logical operations that are required to resolve the associative relationships among the words and concepts". Gaziel's (1997) research on disadvantaged students had shown that academic emphasis predicted 30% (R = 0.30) school performance. These evidence of these researches, therefore, suggests building up of teacher efficacy because it affects student performance (Armour et al., 1976; Asthon and Webb, 1986)

Of the 79 village schoolchildren studied, only 7 (8.86 i.e., 9%) were able to advance part-whole in combination' (III — one boy and one girl; IV - one boy and one girl; V - all three boys). However, 3 sampled teachers, i.e., 33.333%, advanced this kind of perceptual decentering. The Omega statistic (W) in order to be significant between these two percentage differences should have been 0.70. But its obtained value was 0.33 (9% and 33%). Hence, it is inferred that there does not exist any significant difference between the sampled village schoolchildren and their teachers in attaining the 'part-whole in combination', i.e., on the 3-level of perceptual decentering. It is also interesting to note that 45% of these teachers were perceptual non-decenters.

Educational Implications

More explicitly than implicitly, the school curriculum emphasizes the development of analytical, thoughtful, and science like skills in children'. Learning by perception alone does not go beyond empirical observations. Therefore, it is limited to Piagetian figurative knowing, i.e. discovering the physical aspects of things etc. For this reason, Berlyne (1957) opined that "conceptual thinking is not a matter of simple perception". On the contrary, thought and perception in fact are two separate qualities of knowing (Wohlwill, 1964). In conceptual thinking "the perception appears to be one of facilitating, the developmental transformation of the child's intellectual operations from the level of these infralogical structures to more complex and abstract forms of logical functioning" (Flower, 1965). In fact, to utilize the categorical strategy, "higher-order cognitive structures of the classificatory type are needed for processing of the information that the two objects (out of the three) go together because they share a similarity principle constructed by the respondent. The fact that the sampled children failed to show any significant difference in the use of the three conceptual strategies is attributed to their inability to construct a hierarchical category.

Conceptual thinking emphasises the abilities of analyzing, synthesizing and evaluating The textbook mode of classroom instruction does not nurture the conceptual ability of the students. Therefore, this study has to offer two important classroom interventions because, "teachers can not teach what they do not know" (Brophy, 1991), regarding instructional strategies (Adams and Krockover, 1997) i.e., "how internalization of cognitions take place" (Fleckman, 11976). In the first instance, to remedy the perceptual deficits, the students be exposed to Frostig's type of activities (the Figure-ground and aspatial relations) that have been developed on the basis of eco-specific materials, since such a material would ensure their visuo-perceptual sensitivity. Secondly, in order to refine the quality of the classroom interactions, the teachers need orientation in how to muster the learning environment for promotion of the conceptual thinking of the students A theory-backed and empirically-checked deficiency and its remediation like the one proposed would be more effective rather than an adhoc 'should' prescription for the teachers, and then, expecting the development of conceptual thinking in the students.

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3

THE INFLUENCE OF CULTURE ON COGNITIVE THINKING — A STUDY OF SOCIALLY DISADVANTAGED GIRLS OF MYSORE

T. Padmini

This paper is an outcome of the results generated by two studies, one on Rangoli Drawing skills and the other on Performance on Non-verbal Culture Fair Intelligence Tests, among socially disadvantaged girls of primary schools of Mysore The results indicated that the Rangoli knowing group performed better than their counterparts on Raven's Coloured Progressive Matrices Test. The performance of these groups on Draw-a-man Test differed from the performance on Raven's CPM, though both are culture fair tests. Further analysis revealed that there are some essential common features in both Raven's CPM and Rangoli Drawing, which might influence performance on CPM, thereby highlighting the relevance of cultural inputs into pedagogy..

Introduction

The content, method and findings that have resulted from research on cognition have already been applied with profit to cross-cultural studies of psychological development. The opportunities to examine variations in cognitive functioning in a particular cultural context greatly enrich our understanding of the skills which are transmitted from one generation to another and their possible influence on certain other cognitive processes.

This paper is based on the analysis of data on 'Rangoli Drawing Skills' as a cultural factor among the socially disadvantaged girls of Mysore in relation to their performance on Raven's Coloured Progressive Matrices as an index of 'cognitive functioning'. An effort has been made to explore whether a cultural factor like Rangoli Drawing, predominantly a perceptual ability, influences cognitive thinking among socially disadvantaged girls The analysis was carried out on the basis of data collected during two studies at different points of time. However in both the studies the collection of data, the scoring procedures of Rangoli patterns and the nature of the sample (i.e., socially disadvantaged girls) were one and the same, making it possible to draw valid conclusions leading to certain meaningful implications.

Study I — the relationship between the R.D Skills and the performance of CPM among primary school socially disadvantaged girls, their ages ranging from 8 to 11 years, was analysed (N = 280).

Study II — the relationship between the R.D. skills and the performance on two non-verbal culture-fair Intelligence Tests, Raven's CPM and Pathak's Draw-a-Man Test was analysed (N = 240 with an average age of 10 years).

A note on Rangoli Drawing and Disadvantaged Group as well as the procedures followed for collection and scoring of the data are given in the following sections, followed by the findings and a discussion leading to their implications.

A Note on Rangoli Drawing Skills

Rangoli Drawing is a custom in Hindu families of the southern States of India. Rangoli designs are drawn daily in front of the house as the first household core of the day. Moreover, Rangoli Drawing is a must in front of the pooja room inside the house. White Rangoli powder is commonly used whereas coloured powder is used for special occasions like festivals, functions, etc.

The core of Rangoli is its striking symmetry. While one form of Rangoli drawing is based on a structured pattern of data, its stretch being controlled by its dot-base, the other form reassembles a line drawing that could be drawn by starting with a small figure, usually geometrical in shape, and by expanding it further and further adding lines symmetrically to the geometrical pattern base. In fact, in the latter case, there is no limit for widening its stretch unlike the former, and the finished product, if neatly drawn, may look like a spirograph design with highly structured and intricate patterns. Of course its quality depends upon one's own imagination involving spatial relations and practice in framing such designs.

These skills would, of course derive from the cultural environment, typically informal, and would occur in everyday-life situations rather than be set up for educational purposes. Although female members of Hindu families, irrespective of their socio economic status, acquire Rangoli drawing skills in general, socially disadvantaged girls, in particular, were selected for this study because a fairly large portion of disadvantaged girls in and around Mysore city acquire these skills in a cultural context without any formal training To be more specific, maidservants employed in middle and upper class Hindu families draw Rangoli every morning in front of the houses in which they work as part of their duties, and the daughters of such maid servants acquire these skills through self-practice while helping their mothers in performing this study. Many a time, girls of age above eight or nine years themselves work as maidservants on a part-time basis to support their families financially. Such girls also learn the Rangoli drawing skills in order to perform their duties rather than considering Rangoli drawing an art Recently, Rangoli Drawing has come to be considered as a creative art and many groups in the society (irrespective of the socio-economic status) have been showing interest in developing this art among the younger generation by holding Rangoli exhibitions and competitions and using different media for drawing rangolis such as flower petals, salt, coloured dust, etc. However, it is observed that the influence of formal education on acquiring cognitive skills like Rangoli Drawing would be at its minimum because school going girls among the socially disadvantaged group seldom evince interest in their studies owing to poverty.

A Note on Socially Disadvantaged Group

Various psychologists consider disadvantage/deprivation a negative state of life which is an obstacle in the development of human efficiencies. A few social scientists have called disadvantaged persons culturally deprived and have referred to deprivation as a deficiency of the stimulating state of childhood (Garden 1965); as Bolman (1973) aptly points out, deprivation stops persons from taking part in the cultural achievements of their society.

In the Indian context social disadvantagedness reflects not only in child-rearing but also in the child's cognitive intellectual development, adjustment and aspiration levels, attraction for school, etc. Jerome S. Bruner's (1971) interpretation on disadvantagedness applies to Indian situations too. He analyses the three interconnected influences associated with poverty leading to disadvantagedness as· (i) goal-seeking and problem-solving, (ii) language development, and

(iii) social reciprocity. To quote from his famous book, 'The Relevance of Education' (1971)

> *"being socio-economically disadvantaged is no simple matter of deficit, of suffering a cultural avitaminosis that can be dosed by suitable inputs of compensation. It is complex of circumstances.. being at the bottom' often alienated by a sense of ethnic separation from the main culture" (Bruner, 1971, p. 150)*

This 'disadvantagedness' or deprivation is an environmental condition the form of which changes with economic, social and cultural differences. Here "disadvantagedness' refers to the shortcomings of desired experiences, not membership of any particular group. The two criteria followed for considering the social disadvantagedness were : (i) the low socio-economic status of the subjects (considering parental education, income and profession), and (ii) the type of school they were attending (government primary schools located in such areas where a large number of students hailed from low SES).

Thus the sample of socially disadvantaged girls was drawn from 12 different government primary schools in and around Mysore city, catering to low SES groups. All the fourth and fifth graders of these selected schools were considered as 'intact' groups for collection of data. however the data on the Low-SES group only was retained for analysis, leaving aside a few as they belonged to a slightly higher SES

Collection and Scoring of Data on Rangoli Drawings

The subjects were contacted in small groups of 10 to 12 during school hours and were asked to draw Rangoli patterns with either dot-base or line-base or a combination of both on the plain paper with pencil/pen supplied to them. A maximum time-limit of 30 minutes was prescribed and the children were encouraged to draw as many Rangoli designs as they could within that time They were also encouraged to draw neat, novel and intricate designs as far as possible.

Those who did not know Rangoli drawing were also persuaded to try at least one Rangoli drawing; otherwise they were allowed to draw freehand any design of their own choice.

Evaluation of the Rangoli Patterns

As there was no standardised scoring available for assessing the

Rangoli patterns, a systematic qualitative evaluation was carried out. Those subjects were considered 'Rangoli-knowing' who could draw one or more Rangoli patterns with either dot-base or line-base within the given time. Each Rangoli drawn by the subject was assessed for its (i) size, (ii) intricacy, (iii) symmetry, and (iv) number of Rangolis was also taken into account. The scoring Key is given in Appendix I.

Collection of Data on Intelligence

1. Raven's CPM was selected as a factor of cognitive functioning for the following reasons:
   - the nature of the content — involving spatial relations, inductive reasoning, and perceptual accuracy.
   - a standardized, widely used non-verbal culture-fair test of intelligence;
   - its ease of administration on a socially disadvantaged group.
2. Pathak's Draw-a-Man Test was selected as a measure of intelligence, which is another non-verbal culture-fair test.

The instructions and procedure were strictly followed in administering both the tests and scoring the answers. Each subject's percentile ranking was also computed accordingly.

Findings

Study I : The relationship between R D Skills and performance on CPM was found to be positively significant.

The sample of 280 was divided into two groups — Rangoli Knowing Group (RKG) and Non-Rangoli Group (NRG) each consisting of 140 girls — with a further division of the RG into three groups — high, moderate, low. The nominal groups were based on the per centile points: 75th and above — High, 50th to 75th Moderate; 50th and below — Low, as computed from the total scores of R.D.skills. The classification of Nominal Groups are as follows :

RG	*8-9 yrs*	*9-10 yrs*	*10-11 yrs*	*Total*
Whole GP	37	52	51	140
High GP	11	16	15	42
Moderate GP	16	24	20	60
Low GP	10	12	16	38
NRG	50	50	40	140

- As the data of the present study were classified into two main categories — Rangoli knowing and non-Rangoli knowing, and normally of the distribution of CPM scores was not found in both the categories, r_p (bis) was considered the most appropriate statistic to find out the extent of relationship between the two variables - Rangoli drawing skills and the CPM scores vide Table 1.

TABLE 1

Summary of r_p (bis) Values Between RG and NRG for Different Age Groups

Age	*rp (bis)*	*df*	*Level of Significance*
8 to 9 years	0.23	85	0.05 level
9 to 10 years	0.22	100	0.05 level
10 to 11 years	0.23	89	0.05 level

The value of r_p (bis) for all the three age-groups was found to be significant at 0.05 level. It could, therefore, be asserted that there was a significant relationship between Rangoli-drawing Skills and the performance on the CPM to the extent indicated by r_p (bis) ·

Study II : The findings of the performance on Draw-a-Man Test and CPM in relation to R.D. Skills provided a better picture of the relationship between two different intelligence tests and R.D.Skills. The following observations are noteworthy.

TABLE 2

Comparison of Performance on Draw-a-Man Test and CPM

Levels of Intelligence	*Draw-a-Man Test*	CPM
Superior	Nil	Nil
Above Average	3%	4%
Average	45%	21%
Below Average	28%	48%
Definite feeble mindedness (Defective)	24%	27%

It would be seen from the Table (2) that ·

- There are wide differences in the performance of the subjects on two different intelligence tests — though both are culture fair tests

- The overall performance on both the tests is very low — a major portion of the sample (50%) falling below the Average level of intelligence.
- There is no single subject falling in the category 'Superior' in both the tests.

Thus the above findings indicating a very low performance on intelligence tests support many earlier findings on disadvantaged groups.

- The extent of relationship between R.D.Skills and the two intelligence tests was found by computing X^2 and the Contingency Coefficient 'C'.

The findings revealed a positive significant relationship between R.D. Skills and CPM at 0.01 level ($X^2 = 26.8$, $df = 12$; $C = 0.41$) whereas it reached only 0.05 level ($X^2 = 21.7$, $df=12$, $C=0.32$) with the Draw-a-Man Test. It is interesting to note a higher degree of relationship between R.D. and CPM than with the Draw-a-Man Test. This may be due to the type of thinking involved in two different intelligence tests, Draw-a-Man test involving the perception of the human figure of a man (w.r.t. the proportion of the parts of the body and their details) and CPM warranting children's responses in multiple choice items involving perceptual reasoning.

- An analysis of Rangoli drawings of high scorers on CPM (Average and Above Average group) further revealed that they could draw more Rangolis within the given time with a high degree of intricacy and symmetry. Approximately ten per cent of this group (Average and Above Average GP on CPM) was found to be at Below Average level in Draw-a-Man Test performance. This indicates that there are some essential common features in both CPM and Rangoli Drawing — such as concept of enclosure, variety of design structures (both geometric and curved), filling up of gaps, etc., which might influence their performance on CPM. The items in set AB, in particular, in CPM in fact resemble some of the common Rangoli designs drawn by the sample.
- It is interesting to note that the group as a whole exhibited R.D.Skills with a wide range vide Table 3. The percentile points were computed to classify the whole group into nominal categories — High, Moderate and Low.

TABLE 3

Classification of the Sample into Nominal Groups with respect to their Rangoli Drawing Skills

Group	Description	Percentile	Range	No in each category	% of each category
I	Very High	90th +	30-34	19	8
II	High	75th to 90th	26-30	36	15
III	Moderate	50th to 75th	20-25	78	32
IV	Low	25th to 50th	15-19	62	26
V	Very Low	25th and Below	3 14	45	19

(Range of Scores in Rangoli Drawing is from 3 to 34)

Discussion

In the light of the above findings it is clear that the overt cognitive behaviour — the skills and performances — are indeed numerous in the human species. It is equally clear that these skills and patterns are closely patterned on the cultural supports for life. Many cross-cultural psychologists agree that the major problem is to adequately describe the skills profile nurtured in any particular cultural setting (Berry, 1966, 1971, Wober, 1973) Unfortunately, the ways in which the Rangoli drawing skills are acquired among socially disadvantaged girls are not amenable for analysis as the data on the nature of learn ing Rangoli patterns, the length of practice, the motivational level of children in acquiring these skills etc., are scanty. Thus the discussion should be limited to the significant relationship between the two variables established in this study through correlation rather than emphasizing the cause-effect relationship between them. More research is needed for a definite conclusion in this regard.

Thus the analysis of this study establishing significant correlation between Rangoli drawing skills and performance on the CPM provided evidence that the Rangoli drawing skills as a cultural factor present in socially disadvantaged girls influence to a considerable extent their cognitive thinking in general and perceptual abilities in particular.

The results may be seen as providing fairly strong support for the hypothesis i.e., the better the abilities to draw Rangoli patterns, the higher would be the scores on the CPM. This indicates clearly the influence of culture on cognitive thinking among socially disadvantaged girls

Several related cross-cultural studies with both emic and etic approaches are noteworthy as they shed considerable light on the influence of cultural factors on cognitive development. Childs and Greenfield (1980) studied the effect of weaving experience on the representation of clothing patterns in Zinacantaeo children whose schooling was limited. Daragowski and Ellis (1974) examined extensive evidence from a variety of cultures pertaining to difficulty in discrimination abilities. Bushmen tested by Reuning and Wortlay (1973) were able to complete geometric figures when they were given orientation in symmetry. Price Williams studied the effects of pottery making knowledge on conservation of clay substance with Piagetian qualitative approach to assess the cognitive behaviour These studies intending to investigate the cultural patterning of cognitive behaviour in many different ways supported in general the argument that cultural factors (such as weaving, pottery-making, hunting, tailoring, etc.) develop the component cognitive abilities necessary to its performance.

Secondly, it is significant to note the fluctuations in the gradation of CPM Sets A and AB found in this study. Some of the items in Set AB resemble the most common Rangoli patterns drawn by the Rangoli-knowing children. It is interesting to note that Item 7 which is almost similar to a basic Rangoli design was correctly answered by almost 80% of the Group, even though there were wrong responses for the earlier items Items 9 and 11 were also found to be easier ones in the same way but the percentage of cases was found to be less than that of Item 7

Thus the findings of this study showing fluctuations in the gradation of items in Set AB of CPM warrant serious considera tion. This raises a doubt about the strength of the CPM as a culture-fair test. The question — How fair is a 'culture-fair' intelligence test for the S.D. group? — (even though there might be a positive influence on their performance) is to be answered on the basis of more systematic research evidence. Even though many psychologists have regarded the Progressive Matrices as an almost pure test of the 'g' factor, there are some others who have criticized it too. Botner (1965) has criticized the Progressive Matrices' validity and reliability while Anastasi (1961) has pointed out a number of limitations in the Manual informations. Berry (1966) has also remarked that since people with differing cultures and ecologies tend to develop and maintain different sets of skills, the concept of intelligence, or its equivalent is bound to be defined somewhat differently is each society Further, to quote his comments·

> We that our concept of intelligence is not a psychological universal, we will know that the notion of a universal intelligence must once and for all be dropped and the instruments designed to assess it (culture - fair, free or reduced) must be scrapped. (Berry 1966, p 229)

J.S Bruner has also critically remarked about the use of intelligence tests for socially disadvantaged group thus

> "Man is not a naked ape but a culture clothed human being, hopelessly ineffective without the prosthesis provided by culture" (Bruner 1971, p. 131)

Implications

There is strikingly little knowledge available about the transfer of skills from one generation to the next, particularly among the disadvantaged group, in the absence of effect of formal schooling. Curriculum experts should examine what a culture must do in passing on its amplifying skills and knowledge to a new generation, it appears that this aspect has greatly been neglected in the pedagogy of Indian schools.

The society must also place emphasis upon how one derives knowledge from what one has already learned; since a culture transcends the bounds of individual competence, the growth of the individual depends upon how a culture assists the individual to use such intellectual potential as he may possess (Bruner 1971).

The empirical evidence of the present study strongly suggests that some cultural environments such as Rangoli Drawing Skills could push cognitive thinking better than others; this should be indicative of the possibility and feasibility of usefully bring ing in cultural inputs into the school curriculum.

The evidence also suggests that Rangoli Drawing is predominantly an intellectual activity and it is amenable for systematic analysis which yields different kinds of possibilities to adopt it in the pedagogy. The following ideas emerge on the basis of the analysis of Rangoli patterns collected in this study.

First, the Rangoli Drawings are highly structured and can be classified into two main categories

1. Dot Based — (a) Enclaving the dots
   (b) Joining the dots

2 Line Based

Secondly, the Rangoli Drawings convey two modes of thinking —

i. *Convergent thinking* — All dot based structures are limited to the completion of patterns within the limits/boundaries of a dot-grid, thus implying the mode of convergent thinking, however new creations within the dot-grid could lead to the divergent thinking mode occasionally.

ii. *Divergent thinking* — The Line-based Rangolis starting with a small geometrical design, have a scope for expansion of this basic design without any limit. This involves a lot of imagination, organization of space, orientation and directionality, etc.

The majority of the group has produced dot-based structures whereas line-based Rangolis are drawn by a small group of the sample. The essential components of Drawing Rangolis that could be considered for the school curriculum are as follows

Directionality and Orientation : These are essential components of Rangolis and could be fostered with step-by-step training; this in turn may help in building up the writing skills.

Symmetry : The very essence of Rangoli being its striking symmetry, different geometrical shapes/designs emerge through adding small buts of lines (both straight and curved) symmetrical which could be adopted for teaching the drawing skills of geometry

Geometrical Shapes and Their Properties: These could be taught by providing the 'dot grids' to be the base for constructing different geometrical shapes — ranging from simple shapes of triangle and square to a wide variety of complex structures like ellipse, components of circles, etc.

Spatial Relations : The very nature of drawing Rangolis confirms the development of Spatial Relations with comparison and organization of space; the particular way of completing a Rangoli helps to build a 'cognitive map' of the path to be followed.

Divergent Thinking : This could be fostered by providing the basic structure (a small Rangoli or the dot-grid) to be developed further and further without any limit; this in turn greatly enriches the organization of ideas, visualizing the design mentally before drawing (cognitive mapping) etc., which is nothing but an essential component of scientific thinking.

Creative Thinking : As there is no set rule for designing a particular Rangoli, a lot of opportunities to create new patterns of Rangolis could be given to the pupils come out with novel and original ideas: this also develops good aesthetic sense.

Thus it is clear from the above that there is a greater possibility of sustaining the interests of socially disadvantaged girls in school education if their own cultural inputs are incorporated into the pedagogy. Even though many research studies confirm the unpleasant finding that the majority of the disadvantaged group fall far below the line of 'Average intelligence' this should not lead the curriculum specialists to generalise that the failure of our socially disadvantaged children to learn school subjects such as science and mathematics is due to their stunted abilities. The fairness of 'intelligence testing' has been criticized by many cognitive psychologists — but, interestingly, it has been proved in this study that the performance on a Culture-Fair Test could be influenced by a cultural component. It is time for us to realise that we have failed to understand how to teach school subjects to this underprivileged section of the society rather than labelling them negatively — that they are unfit to be in school.

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APPENDIX I

Scoring Key for Rangoli Drawings

Description of the Rangolis		*Weightage*
Size	Small	0
	Medium	1
	Big	2
	Very Big	3
Intricacy	Very Simple	0
	Intricate	1
	Highly Intricate	2
	Extremely Intricate	3
Symmetry	Non symmetrical	0
	Symmetrical	1
	Highly Symmetrical	2
No. of Rangolis	Each	1

4

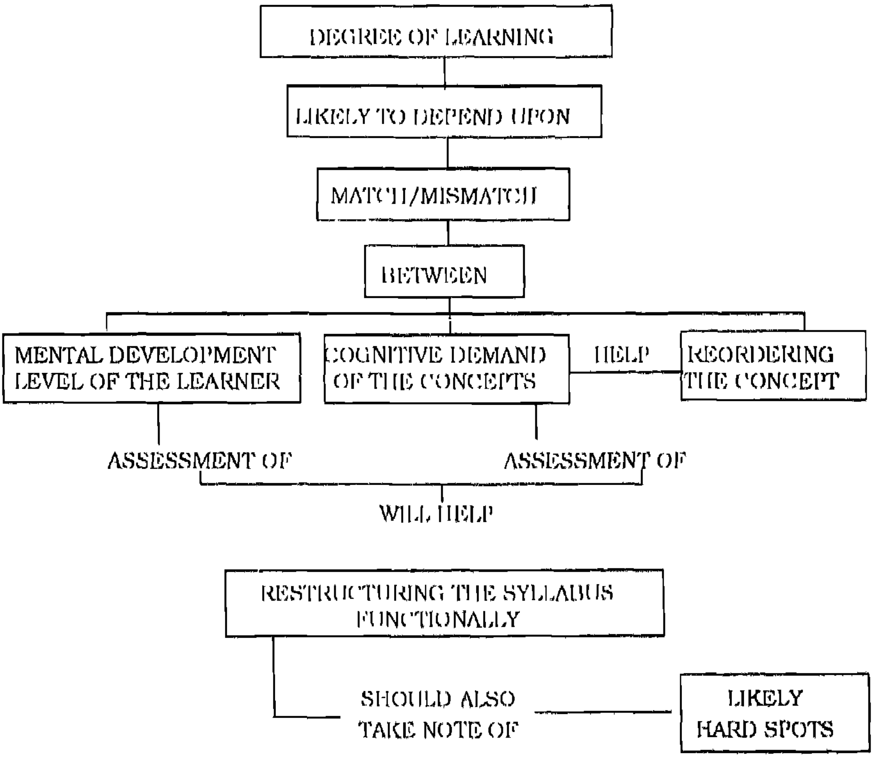
STRATEGIES TO REORDER AND RESTRUCTURE THE CURRICULUM AT PRIMARY STAGE

Madhuri Mahapatra

The study aimed at ascertaining whether the subject-matter related to physics in Class V was appropriately matched with the learners' stage of development or not, in the Piagetian framework. Curriculum analysis depicted that the chapter on Shadows and Eclipses was the most appropriately ordered chapter, whereas the chapters on Force, Work and Energy and Simple Machines warranted reordering. Overall, about 56% of the activities/concepts could be understood by all the students. The activities/concepts having cognitive demand might be either dropped or restructured so that all the students of Class V could understand the entire subject-matter.

Introduction

A survey of UNESCO member states in 1984 led to the conclusion that there would seem to be universal agreement that science should form part of primary education (Mornes, 1990). The National Policy on Education (1986/92), emphasises science education at primary level. Keeping in mind the changing scenario of the scientific world, the science curriculum need innovation from time to time to cope with both the changing national priorities and the long-term development goal of the country, Despite attempts at curriculum innovation, science education in many developed countries remains largely unsatisfactory (Cole 1975, Urevbu, 1984; Ogunniy, 1986) This is possiblity due to the fact that most of these innovations are not scientifically designed One of the possible ways to improve science education is by designing a curriculum by taking Piagetian stage theory into consideration Cognitive development is correlated to scientific reasoning and science achievement in school (Krutnic, 1990). Cognitive psychology can be applied to education problems (Broadbent, 1975) and considerable work have been done by Shayer and Adey in this regard (Shayer and Adey, 1981). Keeping the importance of cognitive psychology in view, in the present study an effort has been made to increase the effectiveness of science textbooks by ascertaining whether the subject-matter related to physics in Class-V is ordered and appropriately matched with the learner's stage of development or not in the Piagetian framework. In addition to this, an interview was conducted to know which the difficult concepts from the pupil's as well as the teacher's point of view are analysis of the curriculum leads to check the ordering of the concepts. Mismatch of the cognitive demand of the curriculum with the cognitive level of the pupils facilitates the restructuring/ innovation of the existing curriculum. Results of the interview may also be considered to improve the effectiveness of the textbook or the curriculum. The conceptual model of the work is given in figure 1



CONCEPTUAL MODEL OF THE WORK

Methodology

Selectronics of the textbook

The Class V science textbook entitled *Exploring Environment* Book III (1997) published by the NCERT was chosen to ascertain the cognitive demand/Piagetian stages of physics concepts by using curriculum analysis taxonomies (CAT). The physics chapters were also used to ascertain the difficult concepts from teachers' and students' point of view The rationale for choosing the text is

- It is used in a number of schools and also provides a foundation for many succeeding science textbooks produced by the States and by private publishers.
- It contains three basic units related to physics namely -

  Chapter 11 — Force, Work and Energy

  Chapter 12 — Simple Machines

  Chapter 13 — Shadows and Eclipses

Selection of Sample

Pupils of Class V of D.M. School and Kendriya Vidyalaya-1 located at Bhubaneswar were chosen to ascertain the cognitive development level of the pupils. For interview, twenty teachers and forty students were chosen from five different schools. Only the top eight students of Class V of each school were taken for interview The reasons for choosing the sample are .

- All the schools follow the CBSE curriculum.
- All are English medium schools.
- All are located in Urban area.
- Socio-economic and cultural backgrounds of the subjects are fairly uniform.
- Top students were chosen for interview keeping in view that if it is difficult for good students it will be very difficult for the whole class.

The details of the sample to ascertain the cognitive level of the pupils are shown in Table 1

TABLE 1
Statistics of the Sample

Name of the School	*No of Boys*	*No of Girls*	*Total Population*	*Grand Total Population*
D. M. School	39	22	61	100
Kendriya Vidyalaya	29	20	49	

Selection of Tool

Based on B. Inhelder and J. Piaget's *"The Growth of Logical Thinking"* during the period 1973-78, the CSMS group at Chelsea College, London, had developed seven SRTs (Science Reasoning Tasks). Task IV, i.e. "Equilibrium in balance", is chosen as the tool to ascertain the cognitive level of the pupils. The reasons for choosing the task are :

- The items in this task are sharp discriminators of the different Piagetian stages (Mohapatra and Mohapatra, 1994)
- The task contains text items with cognitive demand 2B to 3B, i.e., late-concrete to late formal stage.
- Reliability of SRTs under Indian conditions has been verified (Mohapatra & Mohapatra, 1997).
- The task needs simple equipment
- The pupils were exposed to stepwise demonstration of the experiment.

For interview with the pupils as well as teachers, a few questions were set as follows :

- Which is the most difficult physics chapter of your science text?
- The chapter is confusing: Yes/No.
- List down the difficult physics concepts of your science text, chapter-wise.

Administration of the Task

The task investigates the relationship between the optimum Piagetian level and the understanding of science he/she can achieve. The task is a pencil-on-paper task, which took 35 minutes for administration The pupils are set a series of practical problems concerned with making the beam balance with different weights hung at different distances from the pivot The task was administered in the presence of the class teacher to minimise the psychological distance between the test administerer and the testee. The equipment was large enough so that it was visible to the whole class The equipment consisted of the following

- Two metre rules (scales), with numbered holes every 10 cms.
- Six 100-gms slotted weights and two hangers.
- Two retort stands, two boss head clamps.

Table 2 depicts the number of boys and girls at different cognitive levels, schoolwise and Table 3 depicts the percentage of boys and girls of both the schools taken together

TABLE 2
Number of Boys and Girls at Different Cognitive Development Levels School-wise

Stage	*D M. School*	*K V.S - I*
2B	5	8
2B/3A	20	25
3A	10	5
3B	26	11

TABLE-3
Percentage of Pupils at Different Stages Taking both Schools Together

Stage	*Percentage*
2B	11 81
2B/3A	40.90
3A	13.63
3B	33.63

Stage 2B corresponds to the early-concrete cognitive development level of the pupil; 2B, 2B/3A, 3A, 3B correspond to the late-concrete, transition, early-formal and late-formal stages, respectively.

Curriculum Analysis

Curriculum analysis taxonomy has been used to ascertain the cognitive demand of the physics activities/concepts. Two complementary taxonomies were used for curriculum analysis. The first taxonomy describes the psychological characteristics of children's thinking However, the second taxonomy concentrates on the intellectual elements or schemes specific to different types of science activities. The final results of the cognitive demand analysis are presented in Table 4 To avoid error, the analysis work was conducted independently by both the investigators and in case of differences the concepts were again analysed to arrive at a final result.

TABLE 4

Analysis of Physics Curriculum of Class V Students

Units	*Activity Concepts No.*	*Activities/Concepts*	*Taxonomy I*		*Taxonomy II*		*Final Stage*
Unit A	$5a_1$	Listing of different types of motion due to force	1 1	2B	2 3	2B	2B
Force Work and Energy	$5a_2$	Experiment related to existence of force of gravity	1.2	2B	2.8	2B	2B/2B
	$5a_3$	Experiment showing the strength of a force	1 2	2B	2 4	2B	2B
	$5a_4$	Examples showing the effects of a force to stop a moving object	1.6	2B	2.5	2B	2B
	$5a_5$	Concept of frictional forces which oppose motion	1.2	3A	2.8	2B	2B/3A
	$5a_6$	Activities showing the degree of friction in different substances	1 1	3A	2.8	2B	2B/3A
	$5a_7$	Positive & negative effects of friction with examples	1.6	2B	2.7	3A	2B/3A
	$5a_8$	Use of lubricant to reduce friction	1.2	2B	2.6	3A	2B/3A

Units	Activity Concepts No.	Activities/Concepts	Taxonomy I		Taxonomy II		Final Stage
	$5a_9$	Experiment to show the action of an opposing force	1.3	3A	2.9	2B	2B/3A
	$5a_{10}$	Concept of work	1.2	2B	2.3	2B	2B
	$5a_{11}$	Examples of different sources of energy	1.1	3A	2.5	2B	2B/3A
	$5a_{12}$	Examples of machines that gets energy from natural sources like petroleum, coal, etc.	1.1	3A	2.5	2B	2B/3A
	$5a_{13}$	Concept of generation of electric energy	1.6	3A	2.6	3A	3A
	$5a_{14}$	Generation and use of different form of energy like wind energy, solar energy and Biogas	1.4	3A	2.5	3A	3A
Unit B	$5b_1$	Activities giving the idea that work can be done easily if it is divided into small parts	1.2	2B	2.7	2B	2B
Simple Machine	$5b_2$	Activity demonstrating the use of inclined plane	1.2	2B	2.7	2B	2B/2B
	$5b_3$	Activity demonstrating that a screw acts as a winding ramp	1.4	2B	2.8	2B	2B/2B
	$5b_4$	Principle of a screw jack	1.4	2B	2.9	2B	2B/2B
	$5b_5$	Activity showing that a heavy weight can be lifted by using a bar i.e. a lever	1.1	2b	2.8	2B	2B
	$5b_6$	Activity demonstrating the work of a support in the case of lever	1.2	2B	2.6	2B	2B
	$5b_7$	Activity showing use of different types of lever, i.e. hammer, crow-bar etc.	1.6	2B	2.8	2B	2B

Units	*Activity Concepts No*	*Activities/Concepts*	*Taxonomy I*		*Taxonomy II*		*Final Stage*
	$5b_8$	Activity showing that if the support is near the load it is easier to lift a heavy object	1.2	2B	2.6	2B	2B
	$5b_9$	Activity showing use of a pulley	1.1	2B	2.8	2B	2B
	$5b_{10}$	Activity showing advantages of double pulley over single pulley	1.3	3A	2.6	2B	2B/3A
	$5b_{11}$	Concept of a wedge	1.3	3A	2.8	2B	2B/3A
	$5b^{12}$	To compare a short and sharp wedge with a long and sharp wedge	1.1	3A	2.8	3A	3A
	$5b_{13}$	Activity of identifying wedge in a plough	1.5	2B	2.8	2B	2B
	$5b_{14}$	Use of plough	1.3	2B	2.3	2B	2B
Unit C	$5c_1$	Activity to identify and to enlist opaque objects	1.5	2B	2.8	2B	2B/2B
Shadows and Eclipses	$5c_2$	Activity of preparing translucent material and to identify and enlist translucent objects in the surrounding	1.1	2B	2.8	2B	2B
	$5c_3$	Activity related to identification and listing of transparent objects	1.5	2B	2.8	2B	2B
	$5c_4$	Activity showing the formation of shadow by an opaque objects	1.6	2B	2.6	2B	2B
	$5c_5$	Activity showing that the nearer the opaque object to the source of light the larger is the shadow	1.4	2B	2.8	2B	2B
	$5c_6$	Activity showing that the shadow is similar to the shape of the object	1.1	2B	2.8	2B	

Units	Activity Concepts No.	Activities/Concepts	Taxonomy I		Taxonomy II		Final Stage
	$5c_7$	Activity showing that the shadow moves with the observer and in the direction away from the light source	1.6	2B	2.3	2B	2B

The results tabulated above are depicted in Figs. 2, 3, and 4.

Conclusions can be drawn from the graphs to see the appropriate ordering of the various activities/concepts in the Piagetian framework. The logical framework used is as follows :

F(1) Each unit should start with a lower order cognitive demand

F(2) The cognitive demand of successive concepts in a unit may change gradually higher cognitive ability.

(F3) If an unit consists of more than one independent concept domain then the initial concept of each domain should start with a lower cognitive demand.

Analysis of the graphs in the above framework reveals that Fig.3 & Fig.4 confirms to F(1). However Fig. 2 shows deviation. The activity 5a1 (refer to Table 4) of the chapter Force, Work and Energy, i.e., example of motion due to application of force, has a higher cognitive demand as compared to the activity $5a_2$ i.e. experiment related to existence of force of gravity by observing a falling object. Hence in Chapter 11, activity $5a_1$ may follow $5a_2$ or the activity 5a1 may be presented with experiment which demand lower cognitive level. The second dip in Fig. 2 conforms to F(3). Fig.4 depicts that Chapter-13 is the most appropriately ordered one. Fig. 3 conforms that the activities/concepts represented as 12,13 and 14 (given in Table 4 as $5b_{12}$, $5b_{13}$ & $5b_{14}$) may be reordered. The cognitive demand of $5b^{13}$ and $5b_{14}$ are at early concrete level however $5b_{12}$ demands much higher cognitive level i.e. early formal stage. The activity given under $5b_{12}$ may be dropped (or) may follow $5b_{13}$ and $5b_{14}$ (or) may be presented in a different form. The activities/concepts may be reordered so that the Fig. 2 and Fig. 3 follow the pattern similar to Fig. 4

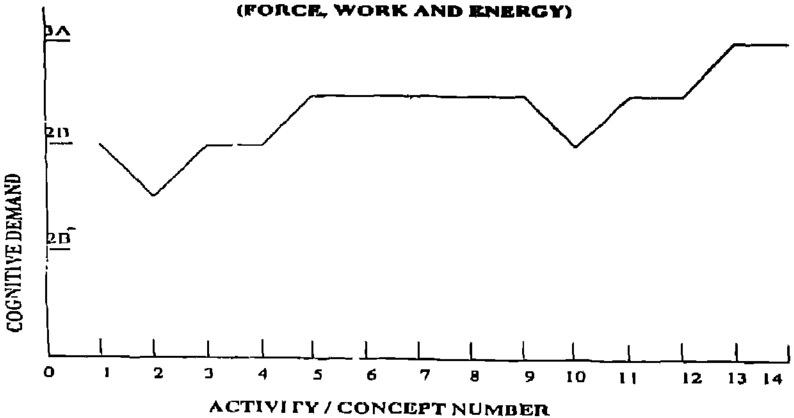


FIG 2 COGNITIVE DEMAND ANALYSIS OF UNIT - (a)

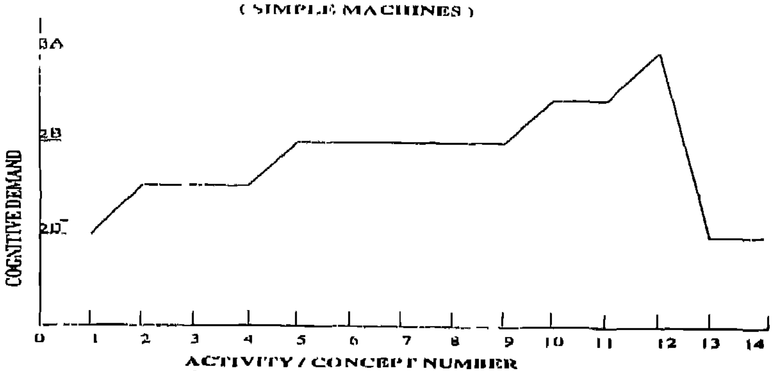


FIG 3 COGNITIVE DEMAND ANALYSIS OF UNIT - (b)

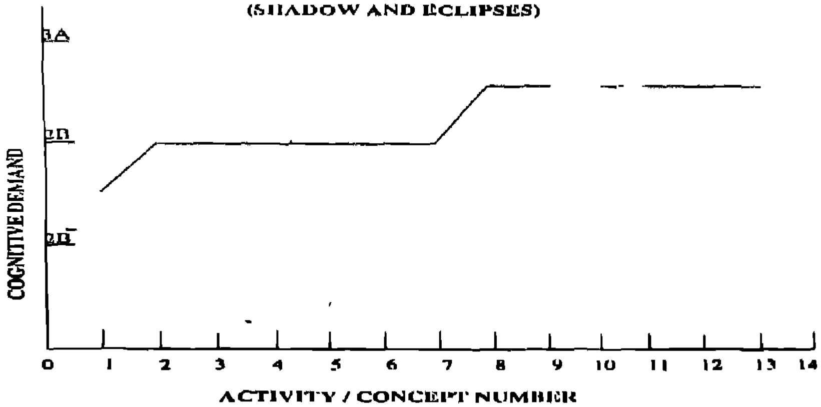


FIG.4 COGNITIVE DEMAND ANALYSIS OF UNIT - (c)

Match/Mismatch Analysis

In Table 5 the percentage of boys and girls of Class V having cognitive ability greater than equal to a particular Piagetian stage has been depicted. Table 6 represents the number of activities/concepts having a particular cognitive demand. The two tables read together do not immediately reflect the cognitive mismatch. Hence graphs are plotted and given in Fig.5 and Fig.6

TABLE 5

Percentage of Pupils (Boys and Girls Taken together) Having Cognitive Ability Greater than Equal to the Indicated Stage

Stages	*% of Pupils of D M. School*	*% of Pupils of K V S.-1*	*% of Pupils taking Both Schools together*
2B	100	100	100
2B/2B	100	100	100
2B	100	100	100
2B/3A	91.81	83.68	88.19
3A	59.01	32.64	47.29
3B	42.62	22.44	33.66

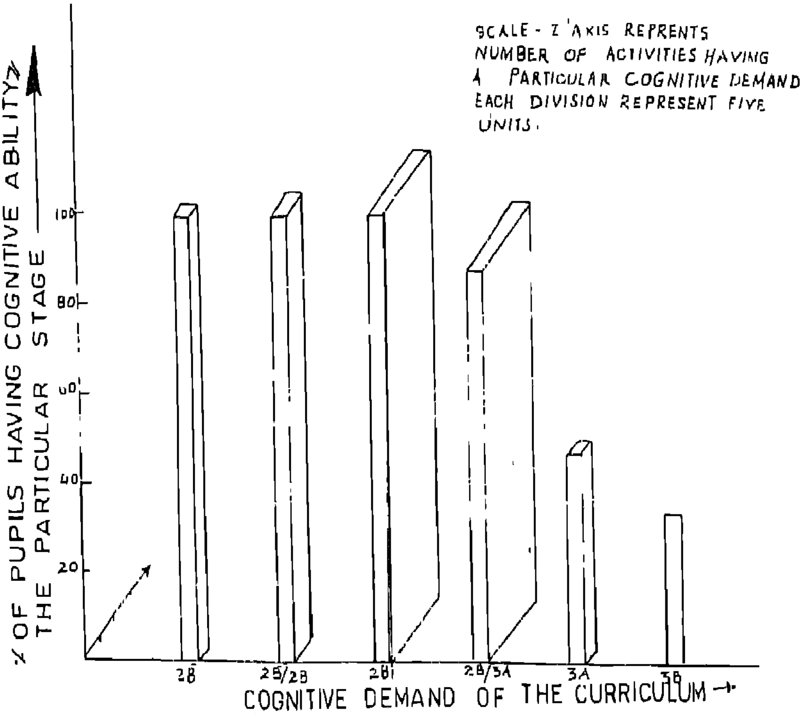
TABLE 6

Percentage of Activities/Concepts Having a Particular Cognitive Demand

Cognitive Demand	*No. of Activities Concepts*	*Percentage of Activities/Concepts*
2B	3	7.31
2B/2B	5	12.19
2B	15	36.58
2B/3A	15	36.58
3A	3	7.31
3B	0	0

Identification of Difficult Concepts

In addition to match/mismatch analysis, the interview technique was adopted to know the difficult concepts. The pupils/teachers were interviewed in individually



SCALE - Z AXIS REPRENTS NUMBER OF ACTIVITIES HAVING A PARTICULAR COGNITIVE DEMAND EACH DIVISION REPRESENT FIVE UNITS.

FIG 5. MATCH/MISMATCH OF COGNITIVE DEMAND OF THE CURRICULUM AND COGNITIVE ABILITY OF PUPILS

Fig 5

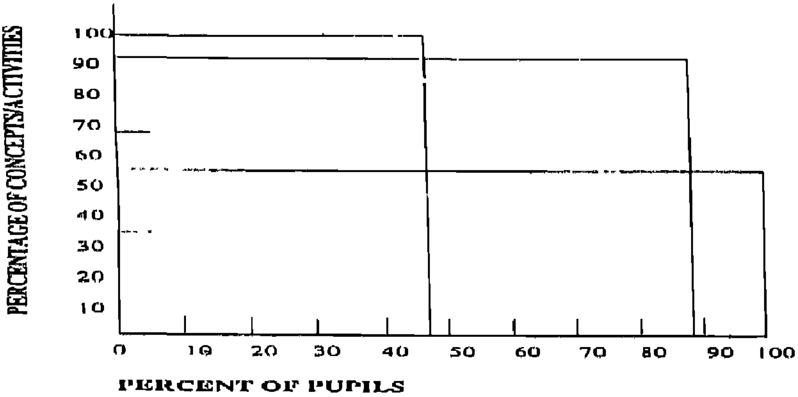


FIG.6 PERCENT OF PUPILS UNDERSTANDING PERCENT OF ACTIVITIES/CONCEPTS.

Fig. 6

The results of the interview are summed up below:

Q. Which is the most difficult chapter amongst the three?

A. All the students are of the opinion that the chapter on simple machines is the most difficult and confusing one. The chapter contains many ambiguous questions like "A pair of scissors is an example of a complex machine or not?" The teachers have marked tendency to rely on the text book and the explanation of such questions are not discussed in the classroom.

Q. Which concepts are difficult?

A1 80% of the pupils said the concept of force and work were difficult . Analy sis reveals that the definition given in the textbook is confusing. The definition of force and work given in the textbook are :

Force A push or pull is called a force

Work . Pulls and pushes which move objects are called work.

The definition of force and of work appears to be similar. Hence pupils face difficulty in understanding these concepts.

A2 The concept of turbine is not clear to 60% of the science teachers teaching in Class V. Almost all the students were not aware of the concept.

Major Outcomes

- Curriculum analysis reveals that the chapter on shadows and eclipses is the most appropriately ordered chapter. The chapters on force, work and energy and simple machines need reordering.
- All the pupils of Class V of both the schools can handle and comprehend activities/concepts having cognitive demand 2B, 2B/2B and 2B, i.e., early-concrete, transition and late concrete levels respectively.
- Approximately 56% of the activities/concepts can be understood by all the students
- Approximately 37% of the activities/concepts which have cognitive demand at 2B/3A cannot be understood by 12% of the students.

- 7% of the concepts/activities which have cognitive demand at the early-formal stage cannot be understood by 53% of the students.
- Around 33% of the students are in 3B, i.e., the late formal stage; however none of the units are in this stage
- The chapter on simple machines is the most confusing one from the learner's point of view
- The definitions of Force and Work are confusing.
- The concept of turbine appears to be difficult.

Suggestions for School Effectiveness

The chronological age of the pupils entering Class V is ten plus, not exceeding eleven years. According to Piagetian theory, the pupils are expected to be in the late-concrete or at best in transitional stage between the late-concrete and the early formal stage Formal thinking starts at the age 11 or 12. The curriculum, to be more effective, should not contain any concept of the formal-operation stage. Until children have acquired the appropriate mental logical structure, they cannot possibly profit from certain kinds of experiences because they will have no internal mechanism for assimilating or accommodating them. Teachers have a marked tendency to rely on official text books and demand their exist ence (Yager, 1986; Hurd et al, 1980, Dreyfus et al 1985). Hence the textbook should be appropriately designed. In this perspective the following suggestions may be helpful

Reordering of certain activities/concepts of the chapters on Force, Work and Energy, and Simple Machines.

- The number of activities/concepts having cognitive demand at the early-formal level may be dropped so that the total population of Class V can understand the entire subject-matter.
- The chapter on Simple Machines may be restructured so as to avoid pupils' confusion.
- Concepts like 'force' and 'work' may be redefined with more practical example.
- The term turbine may be dropped or may be explained in simple terms so that pupil can understand the concept.

- Before writing textbooks, such type of analysis should be carried out extensively so that the students can profit the maximum and the teaching-learning process is more effective, leading to globalisation of primary education and satisfying Education for All by the year 2000.

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SECTION II

Learning Organisation in Special Education/ Multigrade/Multilevel Situations

The studies discussed in this section include.

- Inclusive Education — A Path for the DPEP
- Multigrade Teaching in Small Schools
- Management and Organization of Learning in Multilevel/ Multigrade Situations for School Effectiveness

5

INCLUSIVE EDUCATION — A PATH FOR THE DPEP

Peter Gam

The research comprised comparative longitudinal studies of the changes in paradigms from integrated special education towards inclusive education in Denmark and U.K. over the last two decades. The paper discusses various concepts of integration, namely, co-operative integration, assimilation, fragmentary integration, and formal integration. Further, the paper elaborates the status of the development of inclusive education for students with special needs in India, both inside and outside the DPEP.

From Integration to Inclusion

Change of Paradigm in View of the Danish Experience

Danish integration efforts have roots going back to the school-policy debate of the 1940s and the 1950s. a debate about structure, which gradually created a political majority for the opinion that the differentiation of students after a test in the fifth form had life-long consequences for the students, in fact already determined their future social situation. This debate later split up into two movements: the movement for 'a comprehensive school' and the movement for 'a school for everyone', both of them with integration as their main aim.

The Comprehensive School

This movement wanted the implementation of the comprehensive school and in a broader sense the integration/inclusion of students of all abilities or more correctly, non-segregation

In 1958, an amendment of the law for the primary school was passed, according to which schools were not allowed to divide the students in the first seven years of schooling, and in 1975, the Primary Act on the Folkeskole established in principle a comprehensive basic school from the first to the tenth form. In the same period, however, and until about ten years ago, the number of supportive lessons spent on special education increased quite a lot, and these lessons were mainly special arrangements outside the classroom in so-called clinics at the school.

As a Danish educator and politician, Finn Held, then put it. We didn't suppress the division of school. It is now turning up in another design. This paradoxical incompatibility between, on the one hand, the principal agreement on the aim, 'being willing to integrate even more in general education', and on the other hand, the actual increasing segregation of students and teaching inside and outside the ordinary classroom, has been the focus of the debate of integration in Denmark. Whereas formerly the school system concentrated on the learning difficulties of the students, attention from now on increasingly turned to the condition of the schools — conditions which to a large extent create difficulties for the students.

This point of the view is reflected in the recent legislation. For instance, in the Government Notice on Special Education, it is pointed out: "it lies with every teacher to plan and to carry out his teaching with so much differentiation that to the greatest possible extent it accommodates those differences in learning conditions which the students are having" (MOE,1990)

In 1993, a new law for the primary school was passed. In this law the demand for the differentiation in teaching has also been stressed. (Primary Education Act, 1993).

As the idea of a common norm applied to all students in a school seems to be abandoned, a parallel shift in teacher-work becomes possible. Instead of seeking out and naming student learning differences and deficits, teachers from now on shall focus on creating and tailoring the curriculum and teaching so that schooling in fact is working for every student.

The School for Everyone

The debate about the comprehensive school in the 1940s and 1950s was mainly about the children who had mild 'special education needs' (SEN) but it formed the basis of a further debate about the schooling of children with more serious and severe learning difficulties and other handicaps.

In the Law of 1959 on The Care of the Mentally Deficient, right to education hereafter included all children and as a consequence the 'School for Everyone' movement arose

All children with severe disabilities and handicaps were hereafter considered fit for education and with a right to demand a meaningful education The various needs of the pupils were to be taken care of in an adaptive learning environment The principle that 'the teachingof handicapped students should be broadened in such way that the children could be taught in an ordinary school system' was formulated in the Parliamentary Resolution of May 1969, and this resolution at the same time implied four main principles, which became the guideline for local authorities

1. *The Principle of Proximity* . Assistance to a handicapped child must be offered as close to the child's home and school as possible.
2. *The Principle of Minimum Interference* A child should not receive any more help than is necessary in order to overcome his or her handicap or its consequences.
3. *The Principle of Efficiency* · This means that the situations prepared for the child must be worked out in such a way that a handicap can be surmounted, and/or its consequences can be eliminated.
4. *The Idea of Integration/Inclusion* · This is based on democratic values . that all human beings are equal and have the same right to full participation, a view which gives everyone the chance to become an important and valued member of the community.

These new ideas were breaking new ground and were founded on basic principles of integration, normalisation and decentralisation. Previously, a handicap was seen as an individual defect, which could not be helped. Contrary to this, the new point of view stressed that a handicap was in some way related to the environment and therefore possible to relieve. According to this perspective, one must act on the basis of a concept of equality, saying that disabled persons — to be set equal — have to be treated differently.

The new ideas of the 1960s and the 1970s were deeply rooted in a period of social and economic growth. The implementation during the 1980s was facing an economic set back. thus the idea of 'decentralisation of the care of handicapped children' was reduced to merely an administrative reform.

In January 1980, the legislation related to the primary school was modified, and caused a division between the municipalities and the counties. In future, the municipalities had to take care of the support to students with moderate social and learning difficulty, while the counties had to take care of the students with more severe disability. The combined effects of the principles of administrative decentralisation and legal normalisation meant that the process of integration and inclusion were determined locally. There is no direct legislation on integration, only guidelines.

By making a point of administrative decentralisation it became more and more a matter of physical integration in so-called 'normal' environments — with the idea that social integration was certain to occur. It implied that the individual integrated students were allocated a number of supportive lessons but in addition had to adapt to the principles of the ordinary/mainstream education. It was rarely a matter of mainstream schools trying to adapt to the needs and backgrounds of these children. Consequently, it has depended exclusively on the individual student and teacher, whether integration would succeed or fail (Jensen, 1992).

Status of 'Integration of Handicapped Pupils in the Danish Folkeskole'

According to reports from the Danish Ministry of Education referring to the Helios Resolution of EU, May 1990, the degree of integration of handicapped pupils has reached a level hardly matched by any other country — since only a half percent of the students in primary and lower secondary school have been educated outside an ordinary school environment (Danish MOE, www.Homepage).

Viewed as physical integration, there is a good reason for the Danish satisfaction, but if the intention is that physical integration should be experienced as meaningful too for everyone, more qualitative research is needed before such confident conclusions can be supported.

Danish Research into Integration

I. In the late 1980s Danish research into integration was started, ending 1990. A four- phased research programme was carried out by researchers from RDIER (The Royal Danish Institute of Educational Research) and RDSES (the Royal Danish School of Educational Studies (Jensen, 1990). The quantitative data are based on enrolment in the year 1977-78. The main conclusions were :

- The number of students recorded as students with severe learning disabilities has been constant.
- 70% students have been taught in county special schools.
- Only 8% students have been integrated in the ordinary classes in the Folkeskole
- The results indicate that most of the individually integrated students have been wholly or partly segregated from several of the subjects taught in school.
- The process of integration falls apart as the students grow older and drops suddenly after the seventh form This part of the survey recommends more suitable schooling after the seventh form.

II. In the second part of the research, interviews indicate that the process of integration in the schools often has an accidental character And the practical work of including a student, which should be a joint responsibility of the school, has been left to individual teachers.

  - While the teachers expresses themselves positively about the internal co-operation taking place between the teachers in a class, they express discontent in relation to the other teachers in the school, the school psychologist, administrators and the staff of the youth centres.
  - The general tendency is that the further you move from the classroom, the less cooperation you receive, and it is seen to be of poorer quality

III. In the third part of the research, parents were interviewed. As few mentioned teaching, it appears that children with disabilities are not being teased in the school; but relationships developed in schools seem not to develop into friendships outside of school. Also, many parents said that they don't feel, they have had any real choice regarding the selection of school for their child with disability.

The Decentralised Strategy of Development

No doubt, we in Denmark have had the best intentions, but why have they been so difficult to carry out?

An answer could be that although we since 1969 have had a socially formulated ambition of integrating students with disabilities, the central administration has not yet started a programme of implementation in order to carry out the efforts of integration, but instead left it to the municipalities or, in fact, to the individual teacher.

I would at this point in my portrayal of the Danish difficulties invite for a discussion during this conference on how and to what extent the special education and the efforts have a place in the DPEP, which I am certain will be brought up by the present researchers and officials involved in the programme. I am aware that pilot projects have been started and more are expected in phase, but a comprehensive strategy has to be developed, and here I would suggest that organisations with experience within that field, like SSI, are invited to participate. Again, it is important to have a central plan of implementation, including precautions and actions to be taken, where the decentralised initiative might fail.

For a strategy of development it is of the greatest importance that the experiences are gathered, linked to and disseminated through an institutional network or organisation. Changes of practice (or 'Habitus', to use the expression of the French sociologist Bordieu) are bound to institutions and institutional behaviour. If only practised by single teachers in small 'islands', they will not have much impact on the development.

A decision on placing one special institution in every district has been under consideration. As far as I am informed, the idea is to create at least one (integrated?) institution as a starting point. Let me here suggest that this special institution may function as a resource centre for the schools that are to implement IEDC (Integrated Education for Disabled Children) — a resource centre staffed with experienced special teachers that can offer training, advise on integration and lend out teaching aids and equipment. Co-ordination with the existing District Rehabilitation Centres must, of course, be established. In some instances, one institution may cover all support functions.

Special Education Projects of Development .

In 1988-89, a general primary education programme was launched in Denmark 100 mill DKK was allotted over a five-year period. The programme was leading up to a revision of the primary curriculum. Out of some 400 projects only ten were projects of integration/

inclusion, and only one was a project of complete and total integration, defined by

1. Students follow the same schedule.
2. Students have the same classrooms
3. Students have the same teachers.

(Hatt and Christensen, 1993)

Normally the inclusion of students takes place only for short periods, working with special themes or in certain subjects for two or four hours weekly.

In one case though — Madeskovskolen in Nakskov — the conditionality was fulfilled. The project went on for 9 years and received the status of being a pilot project under the Folkeskole's Development Council. The educational practice was based on the understanding that a handicap is relative, and therefore, among other things, it has determined by local planning and implementation of education. The building stones of this project have been:

- The organisation of the education is regarding subjects and lessons, undivided and unified,
- Alternation between periods of courses with differentiated curriculum connected specifically to the subjects, and periods of themes whose curriculum often cuts across the subject divisions (interdisciplinary teaching),
- workshops, which are based on the experiences of the students and on autonomy,
- daily class meetings and conflict resolution,
- organisation of the two classrooms to make various activities for various groups possible at the same time.

The principles and conditions of the project have been:

- The special class was taught with an ordinary class of the same age.
- The average size of the class was a maximum of 20 students, of whom three to four belonged to the special class. There were also three to four students in the ordinary class who had some minor learning difficulties
- The teacher-team consisted of three teachers, one whom had a specialised educational background.

- The timetabling and organisation of lessons made it possible for two teachers to be present at the same time.
- Both the students of the special class and the students of the ordinary class followed the curriculum, approved by the municipality of Nakskov.

What is remarkable about this project is that it has, throughout the nine years of schooling, succeeded in creating a school life which has included both students with disabilities and mainstream students. In a survey midway in the seventh form, by far the greater part of the so-called 'normal' students said that peer relationships and companionship in the class were good, while most of the students with SEN considered they were very good.

The conclusive findings of this successful pilot project can be summarised as follows:

> Only in a group in which the student or pupil with special educational needs (SEN) or a disability is able to establish mutual educational relations, is getting linguistic stimulation and has good opportunities for communication and help with his individual development, is able to feel well, secure and accepted and feel that he belongs, can the person concerned be said to be integrated (Susan Teller, 1995).

Conceptual Aid to Research and Development — Looking Forward

The American researcher, Diane Ferguson, raises the question, "Are they in or of the class?" The question is important when reflecting on which kind of integration is desirable and/or achievable.

To be in a class is but a physical position, to be of a class is being a member of a community, to share experiences, work and life.

For Pablo Freire, the case is clear. He reaches the conclusion in his theoretical works that a (cooperatively) integrated person is 'a person as subject, whereas an assimilated person is 'a person as object'. I do think most teachers, who have worked for the integration of a single students in a'normal' class will recognise the danger but also how easily you happen to treat a pupil as a case, a person as an object.

The Danish psychologist, Ivy Schousby, operates with four different kinds of integration (Schousby, Ivy, 1989):

1. *Cooperative Integration* · The established social unit and the teachers cooperate on deciding aims for the integration,

because it was never decided in advance — this kind seems to be the exemption.

2. *Assimilation* · The integration of a single student in an ordinary class.
3. *Fragmentary Integration:* The integration of a group of students in an ordinary class, mostly only for limited periods of time, in a few selected subjects, etc.
4. *Formal Integration :* The integration often carried out by politicians and administrators not considering the real context, dealing with people of flesh and blood and soul.

The Norwegian researcher, Trygve Lie, stresses in his definition of integration that .

> Integration from a special education view, can be understood as a process of interaction, where participants with different blackboards are acting without fear of showing or losing identity (Trygve Lie, 1970)

The original meaning of the Latin word "integer" was. 'intact, whole'; what we today express opens up for two levels.

1. The individual, (keeping whole)
2. The social, (making whole).

The German psychologist, Helmust Reiser, and his research team looks upon the process of integration as taking place on four levels (Reiser, Klein, Kreie and Kron, 1987)·

1 Level of the individual
2. Level of interaction
3. Level of institution
4. Level of society.

According to Reiser, the process is characterised by being a process by which you come to an agreement with yourself and/or each other.

Integration may thus be viewed from many angles. You may emphasise the individual and his/her needs, the important social context and interaction You may regard it a moral or merely administrative matter seen from the angle of the society.

But you may rather acknowledge that as an educator with the focus on development processes and using the tools of a teacher — communication, stimulation and social interaction — you cannot disregard any angle or level when working for integration

For the situation in Denmark with a highly decentralised educational system, as for the situation in India, you must add a further level to Reiser's, a level of local community I also suggest teaching and teacher training as a level. In India, which also enjoys a decentralised education administration, emphasis on the role of the local community and the district management is paramount.

In order to talk about, to analyse and evaluate, to promote and to work for and with integration you must include six levels·

1. *Level of the individual* : The basis of the following levels as far as coming to an agreement on the other levels only succeeds if you have come to an agreement with yourself;
2. *Level of interaction:* This is the factual basis for all the processes of integration, and in a way the condition of the level of the individual, too, because it is on that level, you have the possibility of having relationships with others.
3. *Level of institutions* : The level on which the process is initiated, carried out and recorded; it is the primary administrative basis it will not function as sufficient without the former two levels;
4. *Level of society* : The normative — social level;
5. *Level of teaching and teacher training*: A prerequisite for the actual process taking place.
6. *Level of the local community* · The level where the policy and financial matters are decided; (for the later two levels I ow a special thank to Mrs Susan Teller, RDSES, Denmark; the major part of this portrayal is also based on her research and published papers).

Seen Through School Improvement

Operational Examples of Inclusion from the UK Experience

The European and North Americans have since the 1960s been vigorously pursuing the principles of integration and normalisation developed in the Scandinavian countries.

In England and Denmark, the main legislation about SEN was made in 1981. The definition of SEN in the legislation was based on the acknowledgement that SEN were "the outcome of interaction between the strengths and needs of the pupil and the recourses and deficiencies in the pupil's environment — including the educational context "

The legislation made integration conditional on 'the effective use of recourses'. To some extent this was achieved through the/by the LEA (Local Education Authorities) suggested and supported (school) collaboration on 'a higher level' specialist, centres.

UK, 1987

One of the paradoxical effects of the 1988 General Education legislation, which aimed at shaping (primary) education into market economy by increasing the autonomy and accountability of the school, was that on one hand it gave the single school and the school committee a greater responsibility and independence in allocating the funds for the school but, on the other hand, the introduction of the national assessment jeopardized the integration of all pupils. This can be seen from two examples:

I. The new curriculum (NC) was aiming at accommodating the majority of pupils with SEN within its framework. But the NC was·

- focussed on ten (10) circumscribed subjects covering the age-range from five to sixteen,
- it was linked to prescriptive 'study-programmes' and forms of assessment

Thus, the NC did not give much room for accommodation to the needs of SEN children.

II. The allocation of funds to the schools was based on pupil numbers, which again were based on the school's ability to attract pupils (and parents). The competition among the schools was again based on the rating of the schools stemming from the average level of student achievements.

In the British context, I find two distinct directions in the conception of inclusive education. Both add to our understanding of the complicated character of inclusion and give clues to the formulation of a strategy towards inclusion. The first one, here presented by the example of Mel Ainscow's research could be named as 'Through Inclusion towards Comprehensive Schools.' It follows the line from the Jomtien declaration and the Salamanca Statement and pinpoints what the additional value inclusion of SEN pupils can add to the school system and the teaching/learning of all pupils. And it argues that improving the overall conditions of the school develops a wider range of responses to SEN pupils, thus forming a viable way for endeavours of inclusion. I have given a thorough portrayal of his findings, as I find them very useful and operational for the formulation of inclusion strategies. The second stems from a cultural analysis (as opposed to the structural) and opts for combining indigenous and progressive Western education; the latter will only briefly be mentioned here.

Mel Ainscow focusses in his school improvement projects, of which the Navyug Municipal Primary School in Delhi is one, on an action-research model for school development, where teachers supported by colleagues from higher education explore innovative ways of responding to students in their classes. His approach, which is much like the Danish approach, builds on·

- partnership teaching
- warm and relaxed social atmosphere
- broad curriculum
- nurturing individuality.

A structural analysis of the schools involved in his projects (Ainscow, Hopkins, Southwoth and West, 1994) emphasises six conditions for successful development towards more inclusive policies:

I effective leadership, not only by the head teacher but spread throughout the school.

II. involvement of staff, students and community in school policies and decisions;

III. a commitment to collaborative planning,

IV. effective co-ordination strategies,

V. attention to the potential benefits of enquiry and reflection;

VI. a policy for staff development.

I. Leadership

For a supportive leadership Ainscow 95 stresses the importance of:

- the leaders responsibility to create clear visions; formation of teams based on knowledge and experience (opposite to authority);
- to use the team meetings to create a problem-solving climate;

- and to spread leadership functions throughout the staff group

II. Involvement

- It is of great importance to develop strategies for the active involvement of pupils and parents.
- It encompasses clear policies which encourage participation of various stakeholders.
- It includes that the teachers plan their lessons and organise their classroom in ways that encourage involvement in the tasks and activities that are set (e.g., group work).

III. Planning

- It is vital that a school's plans are linked to its vision for the future and that priorities for planning arise from this vision.
- Involvement in the planning process seems to be more important than producing plans.
- The plan is to be seen as a by-product of the planning activity, subject to subsequent revisions

IV. Coordination

The structure of schools are often in literature on educational management referred to as 'loosely-coupled systems' because they consist of units, processes, actions and individuals that tend to operate in isolation from each other and may have very different values. Important factors in promoting change are.

- Increase the school's capacity to co-ordinate the actions of teachers and other stakeholders behind agreed policies or goals.
- Be aware and overlook informal groups' impact on formal structures.
- Give the teachers sufficient autonomy to make instant decisions that take into account the individuality of the pupils.

V. Enquiry and Reflection

Research and observations from DK and UK emphasise that schools which recognise that enquiry and reflection are important processes in any development and improvement find it easier to sustain their momentum and are better at monitoring to what extent which policies actually bring about the desired changes. It is important

- to set up systematic school-based information collection, analysis and interpretation;
- to involve all staff in the information management;
- to adhere in this specifically to classroom practices

VI. Staff Development

Recent research (Fullan, 1991) supports the general experience from school development programmes that for staff development to have a significant impact upon thinking and practice, it needs to be linked to school development. This also complies with the research and theories of, e.g., Bordieu, mentioned above. Bruce Joyce and Beverly Showers (1988) have through their work with peer coaching strategies influenced the British thinking on staff development. They operate with a number of key components which when used in combination have much greater power than when used alone. They are ·

- exploration of theory or description of skill or strategy;
- modelling or demonstration of skill or strategy.
- practice in stimulated and classroom settings;
- structured and open-ended feed-back (performance);
- coaching for application (hands-on, in-classroom settings assistance with the transfer of skills and strategies to the classroom).

More recently, Joyce has distinguished between two key-elements of staff development: the workshop and the workplace. The UNESCO Teacher Education Project, 'Special Needs in the Classroom' , provides an example of how such a workshop may be conducted.

The basic argument of Ainscow (1994) is ". . that the special needs task may be most appropriately perceived as being about school improvement". This means, again according to Ainscow, "that by improving the overall conditions a school develops a wider range of responses to pupils who experience difficulties in their learning".

If a school develops the conditions described above — spreading leadership functions, systematising the collection and analysing of information, involvement of stakeholders and community, collaborative planning, etc. — the change can also impact upon the way the teachers perceive pupils in their classes, whose progress is a matter of concern.

Ainscow also points out that further investigation is necessary before his strategy of 'changes in conditions impact upon thinking and practice' can be recommended with confidence. And he admits that it is not an easy task and will require a shift from the structural frame of reference towards a cultural analysis.

Such a frame is provided by the Tanzanian, Joseph Kisani. In his analysis of traditional education or indigenous 'customary education' he finds four basic principles·

- absence or limited differentiation in space, time and status, thus allowing for individual differences;
- relevance of contents and methods,
- Functionality of knowledge and skills;
- Community orientation

The last two principles are reflected in the primary goals of inclusive education. For Non-Western cultures, inclusive education involves the process of recognising their own strengths of rigorous realistic indigenisation of their education systems in relation to PDWs, and application of affordable technology. Kisani argues that casual (unplanned or unofficial) integration is found everywhere — Africa, Asia but mostly the records escape official notes/documents In official integration the children are labelled in casual not.

Kisani distinguishes inclusion from integration in a cultural context.

- Integration may be likened to the process of cultural or political assimilation, i.e., consciously ignoring the special learning needs of the children and fitting them into existing educational structures or processes (Kyle 1993), setting up special classes, etc. The primary idea is to have PWDs in regular schools irrespective of whether they benefit from the system or not

- Inclusion in comparison is to be likened to the process of cultural accommodation that seeks to retain individual and group identity through a policy of least interference with people's historical, linguistic and psychological features.

Kisanl warns against too easily adoption of Northern programmes · "I see the adoption of such programmes to be driven by availability of funds and donor image, but (without the benefit of research) transplanting such practices in the North into the countries of the South is bound to lead to ineffective programmes" He opts instead for a necessary research based inclusion that builds on a combination of indigenous education and progressive Western forms

Demands for Teacher Education

For the enormous task of achieving an inclusive school there will be an obvious demand for well educated teachers in special education.

The education of these should, in the light of the above developed views, include mastery of ·

- *Organisation of the Teaching-Learning Situation* · To teach in an integration or inclusive class demands a new role of the teacher. The teacher must be able to act as a part of a team, which is mutually responsible for the unified group of students.
- *Development of a Comprehensive Learning Environment* · The conflicts that may arise between the different students and the diverse demands for facilities, concentration etc., which were 'solved' in the fragmentary integration will now find their solution in the room (or in group-rooms next to). The challenge is to make diverse and different students work and develop together.
- *Development of Social Strategies* . Insisting on the fact that the social and the professional side of the teaching-learning process cannot be separated.
- *A Holistic View of Inclusion/Integration* : First of all this implies that the teacher is able to secure a co-ordinated collaboration between school, home and leisure-time activities. It is important to include the resources of the parents in the actual planning of both teaching-learning activities and social activities.

Towards Inclusive Education

The shift in paradigm from integration to inclusion, which has happened in the English-speaking part of the world, is partly a matter of pointing out that the basis of the discussion on providing for students with disabilities and therefore special needs, should not be from the position of segregation The word 'integration' implies that there has first been a segregation, while the concept of inclusion stresses that students with special needs from the beginning are an integral part of the learning environment.

In a situation like in India, where there has not been developed a comprehensive special education system, the road to inclusion seems more easy, than in countries where such a system first has to be dismantled.

We know through experience with development of integration that there are barriers. That some parents and some teachers fear that they will not have the strength and capacity to do the extra work needed But also that there are constraints rooted in prejudice.

The recommendations of the National Workshop on Integration at Hyderabad in October 1997, I find relevant and valid. One might argue that for raising of awareness and giving a specific attention to SEN pupils, a phase of focused effort on the integration of SEN issues in the primary curriculum, pre-service teacher education and allocation of earmarked funds are important. But I advocate not losing sight of the ultimate aim a comprehensive education system, a school for all. Also, the many NGO's working in the field of NFE and inclusive/integrated education provide opportunities for the DPEP's research and development programmes. I have observed that RCI has been very active in Bombay and, working with NCTE on teacher education modules, has developed an integrated model of services in the urban slums at Dharavi and Madras together with CDF (Canada Development Fund) which focuses on children. The project will create five ICDS Anganwadis with its resources similar to the ICDS resources, and it shows how inclusion can be made in this largest service-delivery programme in India. Such pilot models would be a useful way for DPEP to follow in order to develop a format/code for promoting inclusion practices within their programmes.

The Swedish researcher, Ingemar Emanuelson, suggest that the concept of inclusion focuses on "how can collective competencies be developed with the aim at also encompassing that part of the multitude and diversity that is regarded negative". (Ingemar Emanuelson, 1996) We as a society must learn that diversity is the true soul of creation, that we have so much to learn from the wealth in differences, that psychology and pedagogy would never have developed if it were not for the urge to understand these differences

Instead of talking of a child as integrated, the concept of inclusion rather talks about the challenges there lies in keeping a group together, which implies on one hand a struggle with the processes of segregation, and on the other, a shift in the focus from how the individual can join the collective to how the setting of the learning can be altered to accomplish the needs of everybody

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6

MULTIGRADE TEACHING IN SMALL SCHOOLS

N. S. Bharadwaj; Aruna Boda

Field testing was conducted in 10 multigrade-teaching primary schools of Dhar district in M.P. employing innovative ideas of academic use of class monitor, formation of management committees, development of learning corners, group teaching, and use of 'My Diary' in order to uplift the attainment levels of the students. The outcomes were compared with ten other primary schools of the district. The competency-based assessment of students indicated that the achievement of field testing schools in Class IV was 51% as compared to 12.25% in other schools. Similarly, the achievement in Class-V was 47.75% in field testing schools and 11% in other schools. The findings also revealed that these innovative interventions reduced the burden of the teacher and fostered self-motivated learning amongst students, besides enhancing the attainment level of students.

Introduction

Most of the primary schools in rural areas not only have shortage of infrastructure, but also shortage of teachers. More than 90% schools are either single or double-teacher and these teachers are supposed to manage more than one class, to cover the syllabus, to organize examination and to maintain records etc. within the stipulated time. In this situation one teacher may handle standards I, II and III and the other may manage standards IV and V.

This pattern of teaching is popularly known as the Multigrade Teaching system. In this multigrade teaching system, one teacher may be teaching in one class: at the same time the students of the other classes may be given some other activities, like telling stories, repeating numbers or tables, or reading the textbooks This system has also encouraged the practice of memorizing by rote among the students.

By stopping this old practice, a new pattern can be implemented with the help of the class monitor, group teaching, class management committees, learning corners and competency- based evaluation of the learner. These interventions can be utilized to obtain the maximum output.

For an empirical study, ten primary schools of Disltrict Dhar (Madhya Pradesh) were randomly selected, where Standards IV and V were taught by only one teacher. The results of this field testing are very encouraging and can be used for future planning.

Objectives of the Field Testing

The following objectives were fixed for study and field testing.

- To make teaching more effective in small schools
- To revoke the habit of learning by rote and to improve the powers to understand the fundamentals among the students.
- To reduce the extra burden of the teacher with the help of the class monitor.
- To develop the concept of democratism, co-operation, self-decision-making and better citizenship among the students with functional formation of class management committees.
- To ensure better use of educational toys, teaching aids and learning material among the students, with development of learning corners.
- To generate curiosity/inquisitiveness among the students.
- To develop the power of expression, presentation, writing among the students and enable them to present their thoughts, desires, hobbies and inclinations.
- To reduce the burden of the teacher by implementing the innovative ideas of 'My own attendance card', questions before the text, self motivated learning, etc.
- To promote creativity among the children.
- To develop the neo-technique of teaching, so that the learners of deprived and backward areas can also attain competencies at the same level as the others.

- To ensure optimum output with minimum input of manpower and resources.
- To increase average attendance and retention.
- To enhance competencies of students by imparting co-curricular activities

Targets of the Field Testing

The following targets were fixed to achieve the objectives:

- To draft the thought paper on innovative teaching and learning processes
- To select the primary schools for field testing on random basis
- To train the teachers of the selected schools on the basis of the thought paper.
- To evolve a systematic mechanism for monitoring the field testing and to guide the teachers
- To develop educational games/toys and academic activities to be done in classroom.
- To evolve a monthly assessment system for measurement of the learner.
- To develop the class monitor as an 'Academic Assistant' to the teacher, instead of a 'Class Controller'.
- To maintain records of learners and the teacher in newly developed formats
- To use the abilities of intelligent students for development of weak students, by applying group-learning methods.
- To form a weekly and daily teaching plan with the help of students and to teach accordingly.

Development of the Thought Paper

A thought paper was developed with following innovative thoughts:

- *Class Monitor* . How can a class monitor be a good academic assistant of the teacher instead of maintaining discipline?
- *Class Management Committees :* Extra burden on the teacher can be reduced by formation of class management committees.

- *My Diary : My Own Records:* How can the expressive powers of students be enhanced and how can they be promoted to maintain their own records?
- *Learning Corners* How can teaching aids and learning materials be used to obtain better results and reduce the burden of the teacher?
- *Group Teaching :* Can group teaching at primary level give better results with development of enthusiasm and power of expression among the students? And how can the teacher be used as a facilitator?
- *Questions Before Text* Can a method of questions before teaching the text be implemented and can it give better results?
- *Competency Based* : Can an innovative competency-based evaluation method be implemented instead of the traditional evaluation method?

Area of Field Testing

The area of field testing was confined to District Dhar (Madhya Pradesh). Ten primary schools of the district were randomly selected for field testing on the basis of the criteria fixed for selection Similarly, ten other primary schools were also selected to compare the outcome of field testing. These ten primary schools are known as "controlled schools".

Criteria of Selection of Schools

- Coverage of all geographical, social, cultural and linguistic areas.
- Random selection on the basis of equal representation of aforesaid areas.
- Selection on the basis of overall enrolment, enrolment of Scheduled Tribes, average attendance, availability of school buildings, position of teachers, and community participation.
- Selection of rural schools only.
- Strength of students in Classes IV and V, because the field testing would be conducted only in Classes IV and V of the selected schools

Selection of Primary Schools for Field Testing

The primary schools representing different geographical, social, cultural and linguistic areas of the district were randomly selected according to the prefix criteria

The status of the selected schools is given in the following grid.

No.	School	Block	Teachers	Enrolment Overall			Enrolment in		Status of Building
				Boys	Girls	Total	IV	V	
1.	AMODIA	BADNAWAR	02	25	26	51	14	06	4+1
2.	ANJANTAD	GANDHWANI	02	48	21	69	12	07	02
3	AGAR	BAGH	02	95	101	196	20	24	03
4.	ALI	NALCHHA	02	105	60	196	27	30	02+1
5	BODHWADA	TIRLA	02	45	57	102	24	09	04
6	CHILUR	TIRLA	02	76	—	76	18	08	01+01
7	MADAD	SARDARPUR	02	45	24	69	11	05	02+01
8	NIPAWALI.	DHAR	02	37	22	59	10	07	02+01
9	SALHA	DHARAMPURI	02	77	58	135	20	15	02
10.	SURANI	DAHI	02	42	18	60	11	12	02+01
		TOTAL	20	595	387	982	167	123	24+06

- All the selected schools were co-education schools except one primary school, Chilus. Two teachers were posted in all the primary schools during the field testing.
- Only one primary school, Amodiya, was located in a non-tribal area and was under the administrative control of the Education Department. The rest of the primary schools were located in a tribal area and were under the administrative control of the Tribal Welfare Department.
- The schools selected were small schools with small enrolment, but four of them had an enrolment of more than 100, with two teachers.
- The field testing was confined only to two Classes IV and V; so enrolment of these classes is also mentioned in the table.

Selection of Ten Primary Schools to Compare the Outcome

Ten other primary schools were selected to compare the outcome of field testing. These schools were kept controlled during the field testing.

The following grid shows the status of these schools:

No.	School	Block	Teachers	Enrolment Overall			Enrolment in		Status of Building
				Boys	Girls	Total	IV	V	
1.	BAGADIPURA	DHARAMPURI	03	33	17	50	17	16	02
2	BEKLIYA	BAGH	02	36	28	64	11	08	02+01
3	CHILUR(Girls PS)	TIRLA	02	—	58	58	10	08	01+01
4	HAZRATPUR	TIRLA	02	29	11	40	06	06	02+01
5	MIYAPURA	NALCHHA	02	51	27	78	14	17	02+01
6	NANDANKHEDA	TIRLA	02	57	20	77	28	11	03
7.	SAGADIPURA	DHARAMPURI	03	48	16	64	11	14	01
8.	SUNARKHEDI	DHAR	02	45	45	90	17	12	02+01
9	UMMEDPUR	DAHI	02	34	12	46	07	03	02
10.	VALNERA	GANDHWANI	03	54	39	93	08	10	03
		TOTAL	23	387	273	660	129	105	22+06

Status of Schedule Tribes Enrolment

The field testing was conducted only in Classes IV and V. Enrolments of ST students in these classes is shown in the following grid.

Field Testing Schools				Controlled/Comparing Schools			
No.	Schools	Enrolment in IV	Enrolment in V	No	Schools	Enrolment in IV	Enrolment in V
1	AMODIA	05	02	1	BAGADIPURA	08	09
2	ANJANTAD	10	08	2	BEKLIYA	07	08
3	AGAR	20	22	3	CHILUR (Girls PS)	02	
4	ALI	23	16	4	HAZRATPUR	03	02
5	BODHWADA	07	02	5	MIYAPURA	14	17
6	CHILUR	01	03	6	NANDANKHEDA	02	01
7	MADAD	01	01	7	SAGADIPURA	08	07
8	NIPAWALI	01	—	8	SUNARKHEDI	01	01
9	SALHA	01	01	9	UMMEDPUR	05	03
10	SURANI	11	12	10	VALNERA	08	09
	TOTAL	80	67		TOTAL	52	48

Development of Records and Material

The following records were developed to be maintained during the field testing

Records to be Maintained by Learners : Some records were developed to be maintained by the learner himself. These are.

- *My Own Diary* : A small diary was developed to be maintained by the learner himself in which learner can express his views, thoughts, inclinations, desires, interests, hobbies, etc
- *My Own Attendance Card* · An attendance card was designed for every student, which was to be maintained by the individual student. These cards were to be kept in the pocket board of the class. The student concerned was supposed to mark a tick on the card against the date column

Records to be Maintained by Teachers : Some records were also developed to be maintained by the teachers:

- *Record of Class Monitor/Class Committee* · The teachers were to maintain records on class monitors and class management committees, their functions and achievements,
- *Student's Performance Records* . The teachers were to maintain a performance record covering the academic and co-curricular achievement of every student
- *Record of Competency Based Evaluation* ; A competency-based monthly evaluation record was to be maintained for every learner.

Development of Other Formats : Some other formats were also developed·

- Competency-based questionnaire to assess the learners' achievements,
- Monitoring and weekly teaching plan format to assess and monitor the outcome of the field testing.

Development of Other Material : The following materials were also developed to promote the students towards learning by doing

- Teaching-learning material on maths, general science, social science and Language, with development of Learning Corners

- Learning kits with small library and educational toys, to promote joyful learning through play and learning by doing with development of learning corners.

Training of the Teachers

A three-day training for all the teachers of the field testing schools was given during 5 to 7 July, 1997. They were given training on implementation of innovative strategies proposed in the thought papers. This training also covered methodologies, maintenance of records, competency-based evaluation, development of learning corner, group teaching, analysis of My Diary, etc.

Strategies and Methodologies for Implementation

A Thought Paper was developed, covering different interventions to be intervened as input. On the basis of this thought paper, field testing was conducted with the following strategies :

- Various formats, questionnaires, evaluation papers, etc. were developed.
- Teaching aids and learning materials were developed.
- Strategy status reports from both field testing and controlled schools were obtained.
- Training was given to teachers of field testing schools.
- A fortnightly monitoring system was evolved with the assistance of investigators.
- Records at school level and investigator level were maintained.
- Competency-based monthly assessment of the learners was done and the quarterly/half yearly assessment was compared with the assessment of the achievement of learners controlled schools

Outcome and Findings

The major outcome and findings of this study-cum-field-testing are mentioned in the following paragraphs.

Improvement in Attainments The outcome of the field testing shows 37 to 38% improvement in the academic (curricular) achievement of the students, with the same staff. In all the selected field-testing schools, competency-based measurement of learners done and compared with the achievements of controlled schools. This assessment shows that the overall performance of students of field-testing schools in Class IV is 51% and in Class V it is 47.7%, while in the controlled ten schools it is 12 25% and 11%, respectively. This shows that the achievement levels in field-testing schools have improved by 37 to 38%.

Subjectwise comparative statements are given in the following grid:

No.	Subject	*Class IV Average Achievement*			*Class IV Average Achievement*		
		Field-testing School	*Controlled School*	*Average Impro.*	*Field-testing School*	*Controlled School*	*Average Impro.*
1	Hindi Lang.	64%	16%	48%	67%	16%	51%
2	Maths	48%	14%	08%	41%	06%	35%
3	General Sc	45%	10%	35%	49%	15%	34%
4.	Social Sc.	47%	09%	38%	34%	06%	28%
5.	Overall	51%	12/25%	38.75%	47.75%	11%	36.75

Note . Detailed classwise, subjectwise competency-based assessment statements are given in the Annexures

My Own Diary —My Own Thoughts : It was a small diary with some ideal titles like

- I think. . about my parents, teachers, friends, etc.
- I want to be... doctor, engineer, etc.
- Today I want to play... chess, toys, etc
- Today I want to learn... environment, fractions, etc.
- I will like... my friend, my mother, etc
- My desires...
- My problems/complaints...

Every student of the field-testing schools was free to express his views and desires in the diary The students have expressed their views, thoughts, inclinations, desires, hobbies, etc., in their diaries. This has also provided freedom of pace of learning to the students.

Thus My Diary has proved that ' Students came with free expression and practice to transmit their inner feelings, thoughts, hobbies, inclinations, desires, etc., in a better way, which resulted in enhancement of expression and presentation of the students. Their thoughts, desires and bents were accordingly pruned and flourished further by the teacher."

Maintenance of Self-Attendance ' The students of these field-testing schools were allowed to maintain their own attendance cards. Each students had his own attendance card which was always kept in the pocket-board of the class Every student was allotted a pocket in the pocket-board. The student had to make a tick mark in the card against the date of column. The student had to mark this tick in both the sessions, that is pre-lunch and post-lunch It was the duty of the attendance committee to compile a daily attendance sheet with the help of the class monitor.

This self-attendance card has saved at least 10 to 15 minutes per day of every teacher. It has increased the average attendance of the students The irregular students have got inspiration to attend school regularly, just to mark a tick on their cards. This card has created attraction towards and interest in the school among the students.

The card was specially designed and is exhibited below:

Name. .... *Class*..... .. . . *School* .. ..

Date	July		August		September		October	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1.								
2.								
3.								
4.								
5								
6.								
7.								
8.								
9.								
10.								
11								

Display of Students' Creations : This idea has not only enhanced creativity among the students, but it has also helped in increasing average attendance. Writings like rhymes, poems, stories, jokes and drawings/paintings, etc., prepared by the students were displayed on a wall of the classroom. Similarly, creations in clay, terra-cotta, wooden, articles/material manufactured by the students were also displayed in a particular corner of the classroom The paper clippings or cuttings were also displayed. This created interest in schooling among the students and they tried to come to the school regularly. It has also increased creativity and power of expression among them.

Students' Performance Records : Records of students' academic and co-curricular performance were maintained, showing their achievements Similarly, a report card was also maintained showing non-attained competencies of the student

Weekly Teaching Plans : Weekly teaching plans were prepared by the teachers after discussion with the students. Teachers guided the monitor and leader of the committee to select teaching/learning material according to the need of the topic. They also decided the activities to be done to cover certain competencies. The teachers, monitors and group leaders jointly reviewed the teaching plans of the previous week and formed the plan for the next week. This practice has increased systematic teaching as well as freedom of pace of learning.

Class Monitors : Class monitors were elected every month, the monitor acted as the academic assistant of the teacher in the following

- Formation of groups for group teaching.
- Assessment and compilation of the roll call and attendance.
- Distribution of work to class management committees.
- Assessment, management and arrangement of teaching-learning material
- Formation of weekly teaching-learning plan and activity calendar.
- Advance preparation teaching-learning for classroom transaction.
- Arrangement and management of learning corners

The election of the class monitor has developed leadership qualities in a democratic way. Academic use of the monitor has freed the teacher from many classroom activities. This system has not only reduced the burden of the teacher but it has also increased the interest of the student in day to day academic affairs and class organizations

Class Management Committees : Extra workload of teachers has been reduced through formation of different management committees of students on the following managerial dimensions :

- Attendance committee.
- Classroom maintenance and decoration committee
- Water management committee.
- Learning corners and library management committee.
- Sports, cultural co-curricular committee.
- Teaching-learning material management committee

The above stated committees have developed leadership qualities, group work and co-operation among the students. With the formation of these committees,teachers were freed and have focussed upon more academic activities and the classroom transaction.

Bal Panchayats: Bal panchayats were constituted in three schools. One student was elected as the Sarpunch and was assisted by the Punchas Meetings of these Bal Panchayats were held twice in a month They redressed the students' personal grievances and took decisions like bringing the drop-outs or irregular students to school.

Group Teaching and Students' Table : In all the field testing schools, 25 tables of 2'x2'x1' were provided for group learning. By adopting the group-teaching method, the teacher became a facilitator. Teachers simply facilitated groups for a particular topic. The students learnt through group discussions. Every group had sufficient teaching-learning aids according to the demand of the topic and they were allowed to play and learn with these aids

Students' tables were used by the students in group forms. Use of tables and group teaching have certainly enhanced attainment levels of learners. The group method has removed the practice of memorizing by role among the students and they have developed the practice of understanding the fundamentals through the learning-and-doing method This has also proved that the teacher can act as a facilitator at primary level, specially in multigrade teaching

Learning Corners : Play-and-learn is an effective method of learning. It is a very well known fact that theory is born of practice and visual demonstration. Without practice there is no knowledge. A child cannot understand all about the object unless he can see its visual model or photograph; otherwise he frame a different image of the object instead of the original image. So it was felt that there must be some models, photographs and other teaching aids, such as educational toys, kept in the classroom, to help the students to gain practical knowledge.

Keeping in mind the above task, all four corners of the classroom were converted into learning corners which are as under .

Literature Corner : This corner was organized with some comics, small books, stories, paper clippings, word meanings, pocket cards, stick cards, cutouts, etc. This was also known as the library of the class.

Environment Corner : This corner was organized with models and charts on geography, animals, birds, plants, trees, etc. Natural resources like, clay, stones, leaves, different shapes of barks, flowers, sheets, pulses, etc. , were also kept.

Maths and Science Corner : Mathematical and science kits were organized in this corner. Puzzles, teaching aids and other equational toys prepared by the teachers/students with locally available material were also kept.

My Own Corner : This corner was organized with the creations of the students and the local folk arts and culture.

The above mentioned corners allowed students to explore topics of their interest during their free time The corner gave an opportunity to the students to learn through inductive reasoning acquiring knowledge by handling the models. The corners helped the students to expose their attitudes and talents. The use of the learning corner removed the practices of learning by rote among the students and they acquired fundamental knowledge with practical.

Other Findings

No.	*Evaluation Field*	*Status and Outcome of Ten Field-testing Schools*		*Status and Outcome of Ten Other Controllled Primary School*	
		1996-97	1997-98	1996-97	1997-98
1.	Increase in average attendance				
	Boys	67%	79%	64%	66%
	Girls	79%	82%	73%	74%
	Total	73%	81%	69%	70%
2	Participation of students in co-curricular activities	20%	74%	20%	22%
3.	Activity based teaching	18%	70%	18%	30%
4.	Group Teaching	Nil	65%	Nil	15%
5.	Development of teaching learning material as per demand of the curriculum	30%	70%	30%	35%
6	Establishment of students library	Nil	80%	Nil	Nil
7.	Free expression powers of students	35%	80%	35%	40%

The outcome of the field testing shows that by intervening these innovative interventions, the burden on the teacher can be reduced, which eventually results in better performance of the teacher as well as students. It triggers self-motivated learning-by-doing among the students. The achievement levels of the students have also been enhanced by putting these inputs in the class room transaction.

Implications of the Study

The following are the implications of the outcome and findings of the field testing ·

- A short training and orientation of teachers, on teacher-motivation must be imparted at least once in a year.
- The outcome of these findings can be incorporated in the regular teacher training programmes.
- The measurement of the learner should be based upon the competencies attained by the learner instead of the traditional mode of measurement, i.e., annual examination.
- A change is required in the designs of school buildings looking to multigrade teaching. The building must have a suitable place where teacher can sit and control all the classes.

ANNEXURES

Competencywise Comparative Statement of Attainment Levels of Students (Class IV and V) in 10 Selected and Controlled — Primary Schools

Class IV			*Class V*		
Competency	*For selected 10 schools*	*For 10 other schools*	*Competency*	*For selected 10 schools*	*For 10 other schools*
Addition of five digit with carry forward	94%	39%	Concept of fraction, use of "OF" in multiplication and inverse of fraction	47%	5%
Subtraction, concepts of subtraction without borrowing	84%	36%	Concept of decimal, conversion of decimal into fraction	32%	0%
Division of three digits into 5 digit numbers	63%	21%	Addition of decimal in whole number, subtraction, multiplication, division of decimals and its operations in numbers	49%	5%
Multiplication of three digits into 5 digit numbers	50%	11%	Use of rounder, radius and circle	37%	9%
To find out multiples and factors	45%	7%	Angle and triangular	19%	0%
Lowest Common Multiple and highest common factors (LCM and HCF)	38%	0%	Rectangular, area and volume	50%	18%
Concept of fraction and types of fraction	17%	0.5%	To find out average, speed and distance	59%	5%
Unit of mass and change in metric measures	21%	8%	Average attainment	42%	6%
Average attainment 48%	48%	14%			

Attainment Levels of Students

Subject, Maths

Class IV			*Class V*		
Competency	*For selected 10 schools*	*For 10 other schools*	*Competency*	*For selected 10 schools*	*For 10 other schools*
To understand conversation and dialogues in infamiliar condition	63%	17%	To understand the poem debates play and conversation in unfamiliar conditions	75%	20%
To speak the poem with rhythm	93%	45%	To speak on simple and familiar subject and read the hand-written paragraphs	70%	25%
Knowldge of noun, synonyms and antonyms	56%	16%	To read newspaper, maps and legible writing	68%	25%
Knowledge of pronoun, tenses and clear reading and expression	28%	4%	Uses of signs, essay and letter writing	65%	22%
Knowledge of analysis, good handwriting and dictation	86%	21%	To find out the logic of oral and written information	73%	9%
Knowledge of gender, memorial writing, uses of "because of"	55%	9%	Structure of sentence use of language as per situation	73%	11%
Essay writing, structure of sentences in order	67%	3%	To sing song in local language	46%	2%
Average attainment	64%	16%	Average attainment	67%	16%

Subject : Hindi

Class IV			*Class V*		
Competency	*For selected 10 schools*	*For 10 other schools*	*Competency*	*For selected 10 schools*	*For 10 other schools*
Parts of plant, germination of seeds, Nutritious Food	60%	20%	Growth in living things, differences between living and non-living things	84%	43%
Human body, drinking water, water pollution and pure water	42%	10%	Respiration, reproduction and adaptation in Living things	43%	14%
Different states of matters, soluble and insoluble substances, sunshine heat and evaporation	49%	7%	Bone cage of human body and its movements, joints and muscles	33%	10%
Weather and causes of its changing, crops and soil, fertilisation	43%	8%	Deficiency disease, harmfulfood, infectious diseases	37%	7%
Force, work and energy	34%	6%	Properties of air, work, energy and use of energy	55%	6%
Solar system, day and night, satellite of the earth	44%	8%	Transparent and non-transparent objects, soil conversation and simple machines	40%	9%
Average attainment	45%	10%	Average attainment	49%	15%

Subject General Science

Class IV			*Class V*		
Competency	*For selected 10 schools*	*For 10 other schools*	*Competency*	*For selected 10 schools*	*For 10 other schools*
State geography and position of M.P. in the map of country	61%	18%	Globe, shapes of earth, oceans and continents	77%	4%
Knowledge of shapeand size of the earth, rivers, mountains and minerals	52%	12%	Geographical border of India, situation and climate of India	52%	12%
Knowledge of means of transportation and telecommunications	50%	7%	Resources, agriculture, industries and transportation	30%	7%
Knowledge of population culture and tribal people	37%	1%	Freedom struggles and social reformers	29%	4%
Knowledge of historical places, means of entertainment	34%	3%	National goals, fundamental rights and duties, central and state governments	16%	4%
Nutrition, family and society and local administration	53%	14%	National insignia, national anthem, national awards and UNO	15%	4%
Knowledge of great personalities and their lives	48%	9%	Development of human civilisation	18%	7%
Average attainment	47%	9%	Average attainment	39%	6%

Subject: Social Science

7

MANAGEMENT AND ORGANISATION OF LEARNING IN MULTILEVEL/MULTIGRADE SITUATIONS FOR SCHOOL EFFECTIVENESS

Kusum N. Kamat

The study aimed at changing the organisation of instruction for ensuring effective learning of each individual of Grades I to IV in the multilevel situation. There was improvement in pupils' achievement especially low and middle groups, by using small-groups teaching techniques. The study also revealed that self-learning skills could be developed even amongst the first graders and the materials prepared with the Programmed Instruction Approach helped to hold students' interest, and promote active participation and self-learning effectively.

Introduction

Learning takes place from the early years of the life of the child, but formal, systematic learning aimed at achievement of specific competencies within a specific time-span of life is expected to be organised by an older, trained person designated as a teacher, through an institution recognised as a school. If the level of competencies, predetermined by a prescribed syllabus, is achieved by the learners within the specific period of time, the school is usually considered as efficient and effective.

Students' achievement depends upon their pre-school experiences, readiness to learn the prescribed competencies, the home environment, parents' interest, learners' interest and ability to learn, school environment and, most important, the teacher's skill to plan, organise and manage the learning of the students.

Methodology

Considering all the above factors, a programme to improve the achievement of pupils studying in Grades I to IV of Municipal Schools was conducted in two phases.

	Phase	*Period*	*No. of Schools*	*Classes*	*Students*
I.	Pilot Study	1990-93	2	38	1800
II	Tryout on Large Group	1993-96	18	165	6700

Pilot Study

Study : A Study of the Achievement Level of Students of Grades II to IV in language and arithmetic (First Graders excluded begin new entrants).

(a) Competency-based graded test was given to the students and their performance analysed.

(b) Analysis of students' performance in the Annual Examination of the previous academic year were done by the respective class teachers.

Findings : Each class had pupils of different achievement levels, e.g., in Grade IV itself there were students fit for Grade I, Grade II, and Grade III, and only 35% should have been in Grade IV.

Reasons for the Situation and Measures to Be Taken

Both these points were discussed with the teachers concerned.

The reasons could be classified as :

(A) Reasons related with home and parents

- Irregular attendance and long absence.
- Socio economic background of the pupils.
- Parents' apathetic attitude.
- Absence of pre-school experience.

(B) Reasons related with school and teachers.

- Large size of classes (number of children in each class, division).
- Inadequate physical facilities, viz , accommodation, teaching/learning material.
- Pupils' disinterest in learning.

- Pupil's spoken-language at home.
- Achievement level of learners in the same division/class.

The programme was therefore focussed mainly on involvement of parents and creating interest for learning amongst the students, which would be possible, it was presumed, by changing the approach towards the parents as well as the students and the organisation of teaching/learning.

Main Objectives

The main objective was therefore to change the organisation of instructions for ensuring effective learning of each individual in the multilevel class situation of Grades I to IV.

Grouping the Children — Multilevel Classes

Unless the learner is interested in learning, all the efforts would be in vain. Different strategies were discussed with the teachers under the programme. Mainly, the teachers hammered on :

- Large size of the class
- Heterogeneous achievement level of the pupils

Main issue before the teachers who have to organise instruction for a large-sized class with herterogeniety of achievement levels i.e multilevel situation.

Two different alternatives were tried by the teachers from each of the two schools.

Alternative No 1 Formation of homogeneous groups in language/ arithmetic by bringing children from different divisions of the same class together for teaching these two subjects

Alternative No. 2 Formation of homogeneous achievement groups within the class for teaching language and arithmetic.

In Alternative No 1 the problem of the large size of class remained the same. whereas in Alternative No 2, the teacher had to manage small groups with different levels.

However it was unanimously decided to try Alternative No. 2

In the conventional way teachers used to identify the children in three categories as —

- Those who could easily catch the teachers' speed and learn.
- Those who could make some progress under the guidance of and help from the class teacher.
- Those who are far behind and would never be able to learn (teacher's opinion).

In this situation the teacher concentrates only on completion of the syllabus within the stipulated period but does not ensure learning of all. On the contrary, this further increases the differences in the levels of achievement and adds to the reasons of disinterest in learning. Thus the third group, the generally neglected one, gradually loses interest and drops out or completes the year of schooling without achieving any competencies

Either because of the speed of learning or because of absence or may be because of method of teaching, the child is not able to achieve the competency along with the other students. Unless the earlier competency is achieved, the child would not be able to learn further. Under each set of circumstances the teacher has to use different techniques to remove such obstacles in his way and enable each individual to learn

Use of Different Techniques

Different techniques were used for organising instruction in a large group, a small group or for individuals

Large Group .	Dramatisation, Role Play, Games, Projects, Discussions, Demonstrations, Story Telling.
Small Group :	Games, Projects, Group Assignments, Experiments, Story Telling, Exhibition — Display.
Peer-Pair Groups:	Programmed Exercises for Self-learning, Games, Puzzles, Project Assignments.
Individualisation:	Graded Exercises, Individual Assignments.

Approach and Aim of Using these Techniques

To provide learning experiences to facilitate

- Active participation of each individual in learning

- Working in Co-operation
- Developing self learning skills
- Motivating to learn by giving success experience
- Relating learning with home environment
- Learning at one's own speed and pace
- Making learning a happy experience
- Practising the Techniques.

Many a time, teachers know these techniques but how, when and for what purpose they are to be used depends upon the competency or level of competency to be developed and the learning experiences required for mastering the competency by all children.

The same techniques can be used for different competencies, or different techniques may be required for the same competency. This will also depend upon the content (textbook lesson — topic in the syllabus) to be used for developing the competency

The same Techniques for Different Competencies, e.g., Technique of Dramatisation.

(a) Vocabulary to convey meaning
  - Skill of speaking
  - Skill of expression

(b) Combination of techniques for one competency

Competency — reading and comprehension

Technique

- Self learning Assignment for Individual or in small groups of three to four children
- Presenting the summary of the material read especially story/description by a small group with individuals contribution to the whole class
- Presenting the summary through pictures or only giving clues points — Individually.

Planning of a Teaching Unit

One unit of teaching may include use of a variety of techniques as well as a variety of ways of organising learning, depending upon the level of the children and the competency to be developed For example for teaching a lesson describing circus, the teacher followed the sequence and techniques given below:

Organisation	*Technique*	*Competency being Introduced*
Large Group — the whole class	Dramatisation-children performing roles of the different animals	Vocabulary related with topic
Small Group — use of assignments (Confirmation of correct responses by the monitor or given on separate cards)	Different types of graded exercises- suitable to the achievement level of the children	Using new words in sentences

Use of Self-Learning Exercise for Reading and Comprehension

In another case, the majority of the children in the class could read but were not able to comprehend due to new words used in the text. The teacher used a self-learning reading exercise through which they could learn the meaning of the new words. This assignment was meant for the whole class.

The homework given to all of them was to read the lesson from the text and narrate the story in the class. It can be narrated in groups or by individual. Due to development of vocabulary — language competency they were able to read and comprehend

Formation of Small Groups for Facilitating Learning

Small groups were formed in many different ways:

- According to the place of sitting, irrespective of achievement level — managing learning from the peers.
- Assignments given, especially in projects For collecting information, visiting places considering the resources available in and around children's environment —learning in cooperation, developing self-learning skills.

- Achievement level groups — for organising learning situations by the teacher according to pupil's needs of learning — learning at one's own pace, reinforcing learning.
- Self-learning assignments — monitor system — raising confidence — better facilities to interact with peers.
- Self-learning exercises with peers raising confidence immediate feed back — success experience.
- Small group presenting to the whole group — under the guidance of teachers — all of them enjoy learning.
- Performing experiments in small groups enjoy learning, promoted self-learning, develop different learning skills.

Advantages of Organising Learning in Small Groups

In the above para, specific advantages of specific ways of organising instruction in small groups are given. However, in general, any type of learning organisation in small groups promot.

- Interaction between child and child — Children working in small groups help each other. They don't feel shy to learn from peers
- Interaction between the child and the teacher — small groups are more effective from learning point of view.
- Interaction with the learning material — assignment cards and confirmation of current response reinforce learning.

These advantages cannot be sought in the conventional way of large-group teaching.

Formation of Groups with Multilevels

The teachers should organise small-group instruction but the question is how to manage small groups in a multilevel class.

Forming the groups according to level of achievement of competency related with the new competency to be developed was one method of organisation For such kind of formation, the teacher must be competent to diagnose individuals' performance and quickly group them separately to take remedial measures to remove the snags in their learning of the new competency.

In case the gap in learning is very wide, the teacher has to organise individualised instruction by giving them graded self-learning exercises and help them to reach the appropriate level

In conventional teaching, the performance of all the children in one whole class is measured by the same rod, especially measuring the mastery level. Diagnostic evaluation, based on achievement of each level of competency, helps to know where the shoe pinches. For example, after teaching multiplication of a two-digit number with one digit, the performance on the test of this competency revealed :

- A few children did addition instead of multiplication.
- A few of them were weak in calculation.
- A few of them got all sums correct.

In this situation:

Group - I	needs intensive instruction in the concept of multiplication, discriminating addition and multiplication which needs teacher's attention,
Group - II	needs practice in calculation which can be managed with the help of Group III, using remedial teaching material/practice material,
Group - III	can help the teacher for Group I as well as Group II.

Grouping of Students During the Academic Year

In the first term of Grade I, no achievement-level groups were formed. However, the learning activities were organised in small groups from the very beginning, using different techniques, a special curriculum designed by the investigator in the other programme, adopting the same approach. This helped to minimise the gaps in the achievement levels. However, the problem of irregular attendance, especially long absence, ultimately resulted in a multilevel class.

Basic small groups were formed according to the achievement level of language competencies, especially listening and reading, for general grouping purpose, as language is the main medium of learning.

For arithmetic, the students were grouped as per their needs of learning and their level of achievement.

The children were transferred from one group to another on the basis of their progress in achievement after every two months. Thus the children were not labelled as low achievers or middle achievers permanently. This was a motivating factor for the children to take interest in learning and making progress.

Unit Planning of Instruction in a Multilevel Class

As stated earlier, achievement in language competency, especially reading comprehension, is very important in the learning of any subject It is therefore necessary, first to plan for teaching the language of that unit. It is the prerequisite of learning further competencies of the subject, viz , history, geography, science or environmental studies, arithmetic.

In content-oriented subject/topic, one has to plan for teaching the language of that topic only and arrange for working on self-learning assignments under the supervision of the teacher. Here the role of the teacher is that of an organiser, manager, supervisor, etc.

In the planning of any teaching unit, the teacher has to follow the steps as under

- Analyse the target competency;
- List the prerequisites;
- Prepare a flow chart —steps to achieve the target competency — sequence of sub competencies.

List the learning situations for each sequence as well as the evaluation tool to check immediately whether each learner has reached the level

- Keep the material ready for remedial instructions if required.
- Keep enrichment exercises ready for fast learners.

Sources of Learning

It is clear from the above discussion that for organisation of institutions for efficient learning, the teacher has to use different sources, including the usual teaching aids. It will again depend upon the children's ability to use the sources.

In a multilevel class, not all the children are competent to read and comprehend efficiently The teacher, therefore, can not rely on reading assignments while planning and selecting the learning situations. One has to compare their effectiveness. It should not be an obstacle but it should help the child to learn more efficiently and effectively.

Learning situations are meant for providing learning experiences which further enable the students to learn.

The teachers in the programme used different sources for different competencies. In addition to charts, maps, pictures, they used home environment, places in the vicinity, people in the community, for example, a visit to the grocer's shop, or the post office or a garden, gave them first-hand experience which was more effective. The project work used many sources — the members of the family, the people in the community who helped the children — thus project work promotes community participation The teachers opined that they could get more information than what they had because of children's active participation. The teachers related learning with home experience. for example for first-graders in the learning of alphabets, the children could learn the names of things at home, which processed particular alphabets. Signboards, advertisements, newspaper clippings read by the children outside the school with the help of parents or neighbours are also learning sources.

Self -learning activity cards, assignments, graded learning exercises were also the learning aids for the children. Each child could have one's own material which one could use in the classroom. More stress was laid on preparation of aids, using waste material

The planning of the use of the services/material was related with the competency to be learnt.

The same material could be used for teaching as well as for learning; for example, a map or a chart, when used by the teacher in a small group for explaining the teaching point, was teaching material. But when an exercise was given to the group, to study the map or chart and find answers, it became a learning aid.

Management of Situations for Motivating and Encouraging Learning

For organisation of effective learning of students with individual differences, the teacher had to manage the situations efficiently. Management of learning situations included management of space, time — yearly, quarterly, monthly, weekly, daily planning, use and access to learning material, use of sources of learning, managing peer learning groups, managing the involvement of parents, community , etc.

Sitting Arrangement Conducive to Organise Learning Activities: Open space in the middle of the class facilitated the activities like dramatisation, games, action, songs and free movement of the children. This arrangement was enjoyed by the children. It also facilitated sitting in small learning groups.

Display of Student's work: Display of student's work in the class on flannel board gave a feeling of identification to the individuals and this helped to improve the attendance.

Easy Access to Learning Material: Easy access to learning material in the class motivated the children to use it as and when they required.

Time Schedule: The syllabus prescribed particular periods for different subjects per week, e.g., for language 13 periods of 35 minutes each were allotted. But language is not learnt only as a subject to be learnt, but it is also to be learnt in other subjects, too. Moreover, some activities like dramatisation will need more than 35 minutes, and some activities like daily observation of the growth of a plant will need only 10 minutes. Hence the time was scheduled according to the activities planned for the development of a competency.

All such types of arrangement demanded flexibility.

For management of groups by evaluating the progress and transfer to higher groups tests were prepared according to their levels of competencies to know their progress. For the same content, different levels of tests were prepared and used.

In learning organisation, the groups were formed according to the achievement levels of the competencies, to facilitate effective learning. However, for the progress of the whole class, groups of children were formed and reformed on the basis of their performance in periodical, monthly and quarterly evaluation of achievement, mainly in language.

The progress of the class was judged from the decrease in the percentage of low achievers and increase in the middle and high level groups.

Managing Parent's Participation

Weekly and monthly meetings with parents were held:

- to involve the parents in school activities like gatherings,field trips.
- to inform them about the good qualities or drawbacks of their wards;
- to know the background of the students;
- to help the parents to solve the problems of their wards;
- to keep them informed regarding attendance as well as studies.

This helped to improve the attendance

School and Classroom Atmosphere

All the above programmes were focussed on creating a conducive atmosphere for motivating the children to learn and organising the instruction to facilitate each individual to learn efficiently.

But the school atmosphere also contributes to the promotion of learning. In the pilot project, one of the schools was renovated, with spacious and clean classrooms with display boards and blackboards. Light furniture which could be easily shifted by the children was provided This change resulted in improvement in attendance.

Evaluation

Evaluation of the strategies used in classroom organisation was done at every stage by ,

- Giving a questionnaire to the teachers regarding the utility and effectiveness of changed organisation.
- Performance reports of teachers and students given by the Head of the school as well as Inspecting Officers to know the practicability and utility of the strategies.
- Observation of student's reactions — their interest, enthusiasm in participating in learning situations; their willingness to attend the school.
- Studying children's performance in periodical tests and annual examination.

- Parent's opinion about children's anxiety to attend the school and their interest in studies.

Tryout for Multigrade Classes

A multigrade class is as good as a multilevel class. Because of small number of students in each class, the teacher has to organise instruction for students of different grades at one and the same time. It was presumed that the same approach would, therefore, be useful in multigrade class teaching.

Teachers of the rural area in Sindhudurg District in Maharashtra were shown the video modules depicting the approach of organisation using different techniques based on the programme This was followed by discussion by the teachers of primary as well as middle school. The groups, prima facie, remarked that this approach and these techniques would be applicable for multigrade instructions in small schools too.

A three-day workshop on 'Methods of organising instructions in multilevel/multigrade situations' was conducted for the senior-class students of the Junior College of Education, where the discussions were conducted with the help of video modules. The students could make the presentation of some techniques in their own group.

Major Outcomes

- It is necessary and possible to organise instruction in a large-sized class with multilevels of achievement in small groups or individualise the instruction for effective learning.
- For development of different competencies, techniques like dramatisation, story-telling, projects, games, etc., are useful and more effective mainly because of the active participation of the students.
- Techniques like projects, demonstration, discussions, individual assignments, help to develop self-learning skills even amongst first-graders.
- Planning of instruction as per students' level either in small groups or in peer group or for each individual to complete the syllabus in a stipulated time ensures each individual's learning

- Low achievers could progress well, especially in the classes where a lot of learning material was made available and children had easy access to the material.
- Students were helpful in preparation of learning material and helping the peers, which resulted in raising their confidence and creating a lively atmosphere in the class.
- Effectiveness of the learning organisation depended upon the teacher's skill of managing the space, time and planning of instruction for each individual, according to his needs.
- The programmed instruction approach can be used and is helpful for multilevel as well as large-sized class. It promotes active participation, holds students' interest and also helps them to learn on their own.
- Learning experiences planned in relation to the home and the community helped to promote parents' involvement in students' learning.

Implications

- For effective learning in large-sized classes, small group teaching techniques be used.
- For multilevel classes, instruction be organised in groups formed on the basis of level of achievement of earlier sequential competency.
- Remedial measures be taken to fill the gaps.
- In planning of instruction of any unit of any subject (other than language) priority be given to learning of language of that unit.
- Competencies of different subjects be integrated.
- Techniques of teaching in multilevel large-sized classes be tried in multigrade teaching.
- Intensive training be imparted to teachers (pre-service as well as in-service) to use the programmed instruction approach in their day-to-day teaching.

SECTION III

Alternative Approaches to Curriculum

The studies discussed in this section include:

- Back to Basics: Research-Based Lessons for Effective School Learning in India
- Functioning of Alternative Schools in DPEP Districts of Madhya Pradesh
- Capturing the Process of Indigenous Rural Skills for Revamping the Pedagogy at Primary Level
- Achievement in Science and Mathematics as a Function of Learning Organization of Competencies in Mathematics at Primary Stage

8

BACK TO BASICS : RESEARCH-BASED LESSONS FOR EFFECTIVE SCHOOL LEARNING IN INDIA

Andrew Burke

The paper has drawn on relevant researches within and outside India, to learn of solutions for making primary education effective in the context in which schools function in India. It emphasises on the emergence of striking similarities in teaching and teacher education in developing countries. The paper highlights the evidence of an uncritical and unquestioning acceptance of the 'new pedagogy' although there is a lack of awareness of its limitations and problems in the Indian context. An insufficient understanding of the rationale for the new pedagogy on the part of teachers may result in the misinterpretation and misapplication of the approach, thereby fuelling a future reaction against it. Further, the paper also mentions the lack of awareness of the importance of both pre-service and in-service teacher education.

Introduction

The aim of this paper is to address the stated objective of the 1998 NCERT seminar, "to learn of solutions from researchers for making primary education effective in the context in which schools function in India". It will focus, in particular, on the following :

- the pedagogical skills needed for the successful organisation of effective teaching and learning in developing-country schools,
- the typical lack of those skills on the part of teachers in such situations;
- the pressing need for the in-tandem reform of preservice

and inservice teacher education to remedy those fundamental deficiencies,

- the serious dangers involved in an uncritical acceptance of child-centred, discovery-oriented pedagogy in an Indian context where class sizes and other factors set severe limits on the implementation of such an approach,
- the need, in contexts such as India, to pay more attention in preservice and inservice education to developing those formal whole-class teaching skills which most teachers will, of necessity, have to resort to in large class-situations;
- the extent to which the above are being catered for in the implementation to date of India's District Primary Education Programme (DPEP);
- the need for pedagogy -focussed capacity building, especially at the teaching and teacher education levels, to ensure the continued healthy growth of the DPEP and its extension, as envisaged, to mainstream primary education in India.

Methodology

The paper draws on relevant research within and outside India It is informed by work done by the present author on the DPEP in 1997 and his involvement in a DPEP Joint Supervision Mission in 1998 (including visitations to several schools and some teacher training institutions) It will also draw on field work in teaching and teacher education carried out in Lesotho under the Bilateral Aid Programme of the Irish Government and in the Philippines for the World Bank. In this work dozens of developing-country teachers were observed in good, bad and mediocre primary schools in both urban and rural settings and were interviewed about their work and training. Likewise, extensive investigations were carried out in urban and rural based teacher training colleges of varying quality.

Findings

Reynolds (1997) cites Creemers (1994) and Slavin (1996) in support of his claim for international consensus on the following factors as major contributors to teaching effectiveness. Effective teaching, he states, involves clarity of presentation; good management of the learning environment, a restricted range of goals, appropriate structuring of curriculum content, and good questioning skills. In effective teaching, a good match exists between learning task and pupil ability, and appropriate grouping instructional strategies are used. The incentives utilized in effective teaching include high expectations, reward-based control and appropriate feedback. The class-time management of effective teachers maximizes learning time, minimizes time spent on class management and paces lessons appropriately. Finally, effective teaching involves maximized curriculum coverage.

Striking similarities have emerged from research on teaching and teacher education in developing countries, including India (Lockheed and Verspoor, 1991; Burke and McCann, 1993, Burke, Sugrue and Williams, 1994; Refuerzo, 1995; Burke, 1995; Jangira, 1995; Eurydice, 1995, Greaney, 1996; World Bank, 1994, 1997; Ushadevi, 1997). Classroom teaching in such contexts tends to be characterised by the following traits ,

- an approach to pupil instruction that is over-authoritarian, teacher-centred, mechanical, unduly repetitive, and over-concentrated on recall of information;
- a teaching style which tends to treat pupils as passive imbibers of information rather than active problem-solvers,
- under-use and poor quality of teaching aids;
- lack of effective class-management skills and appropriate teaching technqiues to cater for individual pupil needs and differences,
- a serious lack of teaching methodologies related to multigrade teaching and a consequent fear of it,
- failure to match teaching techniques to pupils' learning styles,
- a preponderance of lower-order and an under-use of higher-order questions in teaching;
- an inability to construct appropriate teacher-made tests to assess pupil progress and/or to use the results of these or standardised or criterion-referenced tests for diagnostic and remediation purposes,
- lack of subject-specific teaching skills related to the following fundamental areas mathematics, reading,

writing, science.

- a serious lack of expertise in Special Education, insufficient fluency in the language used for instruction.

The following were among the major identified traits of preservice teacher education

- the low calibre of entrant to teacher training institutions, especially at the primary level,
- the lack of relevance of many of the components of teacher education programmes to the real needs of student teachers and the demands of the actual classroom situations which they will face;
- the not-infrequent mechanical nature of teaching/lecturing in the training institutions themselves,
- the lack of emphasis on and inadequate time devoted to practical aspects of classroom work in teacher training (e.g., teaching strategies, classroom management techniques, reading and language teaching skills; competence in the language of instruction) — areas in which deficiencies were very evident during fieldwork visitations,
- the resultant poor quality and low level of expertise of students graduating into primary teaching.

Inservice Education for Teachers (INSET) tended to.

- operate on the cascade model;
- entail one-off inputs,
- be provider rather than teacher-driven;
- operate in the absence of adequate assessment of teacher needs and, as a consequence, not to be open to thorough evaluation,
- display many of the shortcomings of preservice teacher education

Pedagogical Renewal in India : Prospects and Problems Under DPEP

The DPEP is one of the most innovative programmes ever undertaken by a developing country and may well be a model for similar developments elsewhere (World Bank, 1994, 1997). It is an intensive, innovative and courageous effort by the Government of India to raise enrolment and retention levels and to improve the quality of primary education through the introduction of a more child-focussed, activity-based and discovery-oriented approach to first-level teaching The programme targets investment to districts with below-average female literacy rates and lays particular stress on the education of Scheduled Caste, Scheduled Tribe, working and handicapped children. While the programme is managed at the national level by the DPEP Bureau in the Ministry of Human Resource Development, it is intended to operate on a decentralised basis, to encourage popular participation and to build the capacity of districts to plan and manage primary education. Since the central focus of the DPEP is the improvement of teaching and learning in primary schools, capacity building at State, district block, cluster and school levels is a critical requirement and inservice education for teachers a central concern While the DPEP is currently targeted at areas of greatest need, it is intended that developments therein will, in time, spread to and inform mainstream primary education on the Indian continent. For this reason the progress of DPEP merits serious scrutiny at this stage in its development The present paper attempts such an examination of the pedagogical aspects of the programme.

There is evidence of significant change in teacher thinking and some notable alterations in teaching tactics since the initiation of the DPEP. A pupil-friendly and much less authoritarian atmosphere than heretofore prevails in DPEP schools and classrooms. Considerable time and energy is given to the production of Teaching and Learning Materials (TLMs). The widespread availability of pupil textbooks and teacher handbooks has helped considerably. The availability and accessibility of INSET at Block Resource Centres (BRCs) and the opportunity for frequent teacher dialogue in Cluster Resource Centres (CRCs) have been major factors in the rapid and impressive advancement of the DPEP to date.

The above notwithstanding, several aspects of the current state of DPEP development give cause for concern. While some of these are reminiscent of the difficulties commonly experienced in developing countries (identified above), others are peculiar to India and to the DPEP at this stage of its development. There is evidence of

- an uncritical and unquestioning acceptance of the 'new pedagogy',
- a lack of awareness of its limitations in the Indian context where very large classes are the norm;
- insufficient recognition of the benefits of good traditional, teacher-centred, teaching and of the need to prepare India's primary teachers for this mode of pupil instruction which will inevitably be a major feature of their working lives,
- a lack of knowledge of the problems associated with the new pedagogy in Western countries and the strong reaction against it in some countries (e.g., U.S.A. in 1930s-1950s and 1970s, England and Wales in the 1990s).
- an insufficient understanding of the rationale for the new pedagogy on the part of teachers and a consequent lack of "executive control" over its skills which only those who understand its theoretical underpinnings will have,
- misinterpretation and misapplication of the approach and, as a consequence, the danger of fuelling a future reaction against it, as happened in some other countries;
- a tendency to associate the new pedagogy with a specific set of teaching tactics rather than with a view of educating where the ultimate goal can be reached by different teachers, in different ways and in very different contexts;
- a piecemeal and uneven development of some aspects of the new approach (e.g.,TLMs) to the serious neglect of others (e.g., group and project work, language and multigrade teaching, explaining, higher and lower-order questioning, classroom assessment and use of the same for diagnostic and remediation purposes);
- a lack of awareness of the importance of preservice teacher education as a critical source of ongoing renewal within the teaching profession and of the need to realign initial and inservice provision to ensure a coherent developmental path for teachers,
- insufficient recognition of differentiated levels of expertise among teachers and of the need for different types of inservice courses to cater for those needs

Discussion

Some general and some DPEP-specific proposals follow from the above findings on the fortunes of teaching and teacher education in developing countries. In general, the findings provide an agenda of needs which must be addressed if the desired improvements in teaching expertise and pupil achievement are to be realised in India and elsewhere

Reform of teaching is particularly challenging in developing countries since, in most, it will involve a change of perspective on the part of teachers, teacher educators, and ministry personnel as to what constitutes appropriate, up-to-date and effective teaching of young pupils Reform will require significant changes in preservice teacher education. More time, attention and classroom-practice opportunities will be needed to inculcate the basic skills of effective classroom teaching, always keeping in mind the school and classroom contexts in which the vast majority of trainee teachers will subsequently work Likewise, INSET will have to be provided to compensate for shortcomings in the earlier training of those teachers already in the field — training in the same basic skills of effective teaching being inculcated in preservice training For this reason initial and inservice teacher education should run in tandem, with INSET growing out of, supplementing and extending the training provided at the preservice stage.

Pedagogical capacity building is an indispensable component of effective educational reform. It should ensure a supply of competent, up-to-date trainers for the provision of both initial and in-career teacher education. In many cases, the same trainers may operate at both levels. A not-infrequent tendency in programme implementation is to concentrate resources in the provision of inservice rather than preservice education since the vast majority of teachers are already in the schools. This approach appears very shortsighted and indicates a lack of awareness of the power for renewal which good initial training can provide in any professional area. While the number of new entrants annually to the profession will always be a tiny minority of the total stock of practising teachers, their influence will outweigh their numerical strength, especially if their training has been up-to-date.

At a more fundamental level, what is urgently needed among DPEP teachers is a better understanding of and more balanced approach to pedagogy, an avoidance of the now outdated polarity between traditional/progressive, formal/informal approaches which has dominated debate for many decades in other countries, and a fuller realization that any particular approach to pedagogy is the result of an educator's philosophy and cannot be equated with any particular set of teaching tactics or classroom arrangements (Dewey, 1938, Cremin, 1964, Rothenberg, 1989, Thibadeau, 1994). Current thinking in this regard is put very concisely by Alexander (1995) when he says.

> "The current alternative, which fitness for purpose' embodies, is that the effective teacher is someone with a repertoire of diverse organisational strategies and teaching techniques grounded in early-articulated goals and secure knowledge of subject-matter and pupil learning, who then selects from this pedagogical repertoire according to the unique practical needs and circumstances of his or her professional situation rather than the dictates of educational fashion ideology or habit" (p.2).

Furthermore, Alexander rightly argues that innovative and interactive teaching can be exercised in large-class settings. He cites his own research in several countries as strongly indicating that "interaction style is a function of teacher skill and knowledge, not of class size"(p.19) Indeed,we have all had teachers who taught us very innovatively in large classes and very traditional settings Evidently, in such a context, the teacher's whole-class teaching ability and the availability of good textbooks and other resources is critical. It would seem, therefore, that class size cannot be used as a legitimate excuse for poor, unvarying, mechanical and repetitive teaching pitched vaguely at the middle of the ability range

In light of the foregoing, the following comments on DPEP's progress to date would seem in order

- from a pedagogical perspective, DPEP's development has been impressive and relatively rapid. Its pedagogical advancement to date has been fuelled largely from resources within the Indian system of education. But, like a seed that has grown rapidly and emerged above ground, it is doubtful if DPEP can maintain its momentum without a boost of pedagogical energy/expertise/wisdom from outside of itself.
- such an infusion of pedagogical wisdom would be timely at this stage of DPEP development to counteract the tendency clearly in evidence, towards the mis-interpretation and misapplication of the new pedagogy and

to acquaint all concerned with some unwelcome results of such developments in other countries which adopted the new approach earlier this century.

- an input of pedagogical expertise is also needed to counteract the fairly widespread tendency to equate the new pedagogy with a specific set of teaching "tactics" and, within that narrow context, to seriously over-emphasise some of these (e.g., development of TLMs) and neglect others.

In brief, there is need for some forms of pedagogy-focused co-operation and cross-fertilisation between regions, states and countries to ensure the good health, balanced development, continued growth, and professional sustainability of the DPEP as its pedagogy develops into the future and spreads, as planned, to mainstream primary education in India. If capacity building of this nature is not facilitated, progress from this point forward is likely to be seriously retarded, major errors may be made and discouragement may occur among teachers when the strenuous demands of the new pedagogy become apparent and among parents when unrealistic expectations go unfulfilled (Rothenberg, 1989)

Pedagogical Capacity Building

Professional sustainability of a programme like DPEP entails both the "spreading" of the pedagogical capacity already within a system of education through existing preservice and inservice teacher education structures and the infusion of new expertise/wisdom into a system through co-operative arrangements with other regions, states and countries. India has been quite successful to date in the former and, while valuable co-operative ventures are already taking place in some states (e.g. Andhra Pradesh, Orissa and Bihar), there is need for further national and international pedagogical cross-fertilisation if the needs already alluded to are to be catered for and the dangers identified above are to be avoided. In the view of the present writer, there is an urgent need for further nationally and internationally fuelled pedagogical capacity building, especially at the teacher training (preservice and inservice) level. In particular, the role and capacity of the District Institute of Education and Training (DIETs) and other teacher education institutions to meet the training needs of a rapidly developing primary education system would seem to merit serious examination at this point.

While the DIETs have traditionally played a major role in both preservice and inservice teacher education, they appear to have been under-utilised in the DPEP. The new structures created under DPEP and, especially, the central role now assigned to BRCs, is perceived by personnel in many DIETs as having weakened their position in the provision of inservice education. This seems to have created an identity crisis for several DIETs. Morale appears low and has not been helped by the transitory nature of DIET staffs and the failure to fill several vacant posts. In addition, most DIET staff members pre-dated DPEP As a result, they may no longer feel fully competent to meet the emerging needs of a rapidly developing programme.

A re-definition of the role of DIETs is needed. While they should continue to meet their traditional responsibilities in the preservice training of teachers, their role in INSET may have to be re-thought, especially in DPEP districts where BRCs are now playing an effective role in inservice provision While one would not wish to exclude DIETs from inservice work, it would appear, to the present writer at least, that the expertise of DIETs would be best utilised, not in providing inservice education directly to teachers but, rather, in "providing the providers" of inservice education who would subsequently operate through BRCs and other channels to service the needs of the classroom practitioners. DIETs should be among the major institutions through which new and up-to-date expertise is infused into the teaching profession both at the preservice and inservice levels. Consequently, serious attention should be given to the proper funding and staffing of DIETs, the up-to-date training of their academic staffs, and greater utilisation of their expertise in the service of the DPEP.

At this point the question arises as to whom DIET and other teacher education personnel would consider acceptable and competent to provide the type of up-to-date training which they need. It is in this context that the co-operative national and international arrangements already suggested for pedagogy-focused capacity building in India would seem particularly appropriate. Capacity building is to be welcomed at all levels and for all facets of the Indian primary education system and good progress will be made only if an integrated approach to such development is taken. It is the argument of this paper, however, that if pedagogical capacity building at the teacher education and classroom teaching levels does not receive the attention it needs at this juncture in DPEP development, progress will be seriously retarded irrespective of how much capacity building has taken place at other levels of the system.

Clearly, capacity building at the level of apex and other higher-up institutions is to be warmly welcomed and the annual NCERT seminars provide a most valuable national and international forum for the sharing of ideas. However, ideas are not enough and capacity building confined largely to this level is so far removed from classroom realities and teacher needs that its impact is unlikely to reach the "chalkface" in any effective manner in the lifetime of the DPEP or, perhaps, for a long time thereafter. In this regard Reynolds (1997) makes the following very pertinent remarks about research-based ideas on effective teaching and how they may take root in actual classrooms:

> "The ideas themselves are not enough — they need to be made relevant to those like teachers with a 'craft' orientation. To use a culinary analogy, ideas about Indian or Chinese food have been around for hundreds of years without being picked up in Europe. What it needed was for the ideas to be brought by people (Chinese and Indian migrants) who could pass on the craft... What we need are the educational equivalents of the Chinese and Indian cooks... to take school effectiveness into schools as a craft based activity rather than relying on school-effectiveness researchers trying to disseminate it from a research perspective. The accounts of these exemplary practitioners' are likely to be qualitative, rich, focused on personalities as much as methods, and highly context specific" (p. 109).

However, if capacity building at the level of these higher institutions is the only avenue currently open for such developments, it should be availed of. Considerable emphasis should be placed, however, on pedagogy-focused capacity building through the training of personnel in the areas of greatest teacher/school needs. In focusing its seminars on school effectiveness issues, the NCERT is making a very significant contribution in this regard.

The ultimate criterion by which a major project such as DPEP will be judged will be the extent to which it has expanded access to and increased retention in schools, enhanced the quality of teaching, and improved the levels of pupil achievement. While many factors facilitate educational progress, success ultimately depends on the quality, commitment and expertise of classroom teachers. It is they, not ministries of education, schools' inspectors, researchers or teacher trainers, who teach pupils. It is they who make the many within-class decisions each day that impact critically on the lives and future prospects of their pupils and, ultimately, on the welfare of their countries (Levin and Lockheed, 1993; Burke 1996, 1997). Furthermore, because of widespread illiteracy among parents, dependence on teachers is very much greater in developing than in developed countries (Greaney, 1996). The centrality of the teacher's role and the importance of targeting resources at the teaching context is further borne out by the work of Wang, Haertel and Walberg's (1993). In their review of research on factors affecting school outcomes they concluded

> "The action of students, teachers and parents matter most to student learning; policies at the program, school district, state and federal levels have limited effect compared to the day-to-day efforts of the people who are most involved in students' lives" (p.279)

For this reason Kellaghan (1994) argues that "resources that are allocated to the actual teaching-learning situation are likely to be more beneficial in terms of students' achievement than resources that are allocated to activities that are remote from that situation" (p.16).

In the light of the foregoing, it would appear that the prospects of all education reform movements, projects or programmes depend heavily on the extent to which teacher needs have been identified and catered for. However, in the experience of the present writer with large-scale programmes like DPEP, the delivery of services to the end-users in schools and classrooms often receives insufficient attention. In view of this, considerable stress has been placed in this paper on the need for capacity building at levels closest to schools and teachers. Greater involvement of practising teachers (and teacher educators) at all levels of DPEP planning and implementation than currently obtains is counseled. This would help to engender greater teacher-ownership of the programme. It would also help the ensure accurate identification and effective delivery of INSET relevant to their felt needs for, as Eraut (1994) points out, if teachers do not recognise a need as having sufficient priority for them, activities aimed at meeting that need will be judged irrelevant.

Conclusion

The best and the worst of teaching can be observed in both developed and developing countries. It would be true to say, however, that teaching and teacher education in developing countries share significant common traits that impact negatively on the effectiveness of learning in their primary classrooms. These present major challenges to education ministries.

The shortcomings of practising teachers and the poor achievement levels of primary school pupils in developing countries reflect, among

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9

FUNCTIONING OF ALTERNATIVE SCHOOLS IN DPEP DISTRICTS OF MADHYA PRADESH

Reeta Sharma; V.P.Gupta ; V.P.Singh

The study was conducted in 37 Alternative Schools (AS) of six DPEP districts in Madhya Pradesh with a view to forming an idea of the efficiency of the present system of Alternative Schools in achieving the goals of DPEP. It was revealed that in general the functioning of AS was satisfactory Although, majority of the student population in these AS belonged to the backward classes, the enrolment increased throughout the year without many dropouts. The number of girls attending the AS was also quite satisfactory. According to the findings, AS needed regular supervision and monitoring, timely supply of sufficient TLM and intensive and frequent training of teachers.

Introduction

Universalisation of Primary Education is the concern of one and all for the welfare of the society and development of the nation but it cannot be achieved only by the formal system of education. Even the Non-Formal Education system has not been able to achieve the targets as the evaluation of NFE in M.P has revealed that only 45-50 percent NFE centres are functional (Gupta, 1993). Therefore, as an alternative strategy the concept of Alternative Schooling was introduced by the Rajeev Gandhi Prathmik Shiksha Mission, Bhopal, in the year 1994-95. The concept of Alternative schools (AS) was devised where social or individual needs were not adequately fulfilled by the existing educational establishments (Andreas, 1996). The system of Alternative schooling redresses the key limitations of formal primary schools so as to draw in the group of children most difficult to enrol and retain, such as migratory working children and those dwelling in remote inaccessible habitations; the disadvantaged group of children and, especially, the girls looking after their siblings at home

As per the State plan (1994), 430 AS were to be opened in the form of 43 projects in 19 DPEP districts in the year 1995-96, but only 392 AS were started. Some of the salient features of the AS are given below.

- The school will run for four hours every day.
- The timings and venue of the school will be decided by the local community.
- The school will have two teachers-one of them essentially being a female teacher.
- The teachers will be local youth.
- The minimum qualification of the teacher is kept as X pass, which can be relaxed only in exceptional cases.
- Teachers are given 21 days' intensive training before joining the school.
- A monthly salary of Rs 500 is paid to the teachers in the monthly meetings held at Block HQ by cheque (now increased to Rs 1000 p.m)
- Two-day monthly meetings are held at the Block HQ to review the progress made during the month and discuss problems of the teachers.
- No concept of 'pass' or 'fail' exists. There is a provision of continuous evaluation and allowing children to learn at their own pace of learning
- There is a provision of Rs 500 per annum per teacher for development of teaching aids and for innovations.

In 1996, when the project had just completed one year, it was decided to evaluate the project in order to judge its strengths and weaknesses which would serve as indicators to bring about improvements in the system. This paper deals with the general functioning of Alternative Schools of 6 DPEP districts of Madhya Pradesh.

Objectives

The study was conducted with the following objectives

- to identify the strengths and weaknesses of AS.
- to assess the enrolment and drop out status in Alternative Schools;
- to gather the opinion of teachers, supervisors, parents and community members about the functioning of AS.

Methodology

The present study is confined to the six districts of Madhya Pradesh, namely, Betul, Dhar, Raisen, Rajgarh, Rewa and Sehore. 120 Alternative Schools in the form of 12 projects were to be opened in the year 1995-96, but 119 AS were actually started. The data for this study were collected from 37 AS randomly selected from 12 blocks (two or three AS were selected per block) of six districts — 3 from Betul, 8 from Dhar, 7 from Raisen, 7 from Rajgarh, 6 from Rewa and 6 from Sehore (Table 1).

TABLE 1

Details of Number of Alternative Schools Sanctioned, Opened and Used for Data Collection

S. No.	District	Block	No. of AS Sanctioned	No of AS Opened	AS Visited for Data Collection: For Interim Report	AS Visited for Data Collection: For Final Report
1	Betul	Betul	10	10	1. Goledhana	1. Sapnacolony 2 Thandinal
2.	Dhar	Sardarpur	10	10	2. Kiloli	3 Nandna 4. Deogarh
		Badnawar	10	11	—	—
		Nalchha	10	9	3. Bhura Kuwan	5 Chunabhatipura 6 Phalkiyapura 7. Bherughatpura 8 Banjaripura
3.	Raisen	Badi	10	10		9. Ghont 10. Kothri 11. Nangpur
		Obedullaganj	10	9	4. Khoa	12. Kheritappa 13. Camp No 5 14. Bamhori
4.	Rajgarh	Khilchipur	10	10		15. Rampura 16 Mannipura 17. Manpura
		Narshingarh	10	10	5. Belwa Dhati	18. Badisewrii 19. Chhabra 20. Rukulya Khedi
5.	Rewa	Rewa	10	10		21. Odki Khurd 22. Kannoji 23. Bayanbohiritola 24. Lakhaiya
		Mahuganj	10	10		25. Mudriya 26. Pateri Shripat
6.	Sehore	Ichhawar	10	10	6. Indira Nagar	27. Goyal Khedi
		Budhni	10	10	7 Atroliya	28. Semariya 29. Dhankot 30. Indiranagar
		TOTAL	**120**	**119**	**7**	**30 = 37**

The data were collected with the help of tools constructed in collaboration with MPSCERT. The items in the tools pertained to distance of AS from Block and District H.Q., timings of AS, enrolment and attendance of children, availability of teaching-learning material, method and frequency of evaluation of children and opinion of teachers, supervisors, parents and community members.

The efficacy of the tools was tested by conducting a pilot study. These were then modified and finalised on the basis of the feedback received To ensure the authenticity of the study, the visits to the schools were made unannounced.

To study the different aspects of 37 AS, observation schedules were used. To prepare a profile of AS teachers, supervisors, parents and community members, tools in the form of interview schedule were used for 60 teachers (37 M and 23 F), 11 supervisors, 55 parents not sending their children to AS, and 128 community members.

Major Findings

The data collected through the tools used for the study provided information on· distance of AS from Block HQ and District HQ, venue and timings of AS, enrolment pattern and dropouts, availability of Teaching-Learning Material (TLM), evaluation and opinion of parents, teachers, supervisors and community members — are discussed below.

Distance of AS from Block and DistrictsHQ

While starting a project, identification of the location of an AS is quite important for effective supervision, monitoring and evaluation. As far as possible, 10 Alternative Schools, constituting one AS project, should be within a radius of 10-20 km The distances are depicted in Table 2, from which it is clear that out of 37 AS under study, 19 AS (51.35%) are within the range of 10-20 kms from Block HQ. Five AS (13.31%) are located at a distance of 20-30 km, whereas 13 AS (35.14%) are situated at a distance of more than 30 km from their Block HQ. As stated the earlier, the distance of the AS from Block and District HQ should be easily manageable. This point may be kept in mind while opening any new AS project.

Venue of AS

The AS were held either at a teacher's residence, a community member's residence or other places like a temporary shed or under a tree, etc. The venue of the AS should be spacious and comfortable and an undisputed place. It may be mentioned here that in district Raisen one of the reasons for dropout was found to be the improper and disputed venue of the AS, due to which parents stopped sending their children to the school. The authorities should convince the community members to provide a proper venue to hold the school at.

TABLE 2

Distance of AS from Block and District HQ (N:37)

			Distance from B block HQ			*Distance from District HQ*				
Sl. No.	*District*	*No of AS*	*10-20km*	*20-30km*	*>30 km*	*10-20km*	*20-30km*	*30-40km*	*40-50km*	*>50 km*
1.	Betul	3	2	-	1	2	-	1	-	-
2.	Dhar	8	1	1	6	-	2	-	1	5
3	Raisen	7	3	1	3	-	-	1	2	4
4.	Rajgarh	7	3	3	1	-	2	1	1	3
5.	Rewa	6	6	-	-	4	-	-	-	2
6	Sehore	6	4	-	2	1	1	1	-	3
	Total	37	19	5	13	7	5	4	4	17
	%		51.35	13.51	35.14	18.92	13.51	10.81	10 81	45.95

Timings of AS

It is because of the inconvenience of timings of formal schools that a large number of children are forced to be out of school inspite of their willingness to join them. This is because the children are either to accompany their parents for supplementing their income or are to be at home to look after their siblings. Therefore, the timings of holding the schools were left at the discretion of the concerned clientele. However, the community members were informed that a minimum of 4 hours input is necessary to achieve the desired results. It was found that the majority of the schools were held from 11.00 a.m. to 3.00 p.m. Mornings and evenings in most of the schools were kept free for the children to look after their domestic work.

Enrolment Pattern and Dropouts

Category wise enrollment of children is presented in fig.1. Out of the total children enrolled upto 31 Aug., 96, 17.3% belonged to scheduled castes, 34.5% to scheduled tribes and 39% to other backward classes and only 9.2% children belonged to the general category

Regarding the percentage of girls enrolled in these schools it was found that 42 8% of the total strength was that of girls. This percentage is unlike that found generally in Indian village schools where the number of girls is half or even less than that of boys (Grover, 1988). But this is a healthy trend and indicates increasing awareness of villagers towards girl child education.

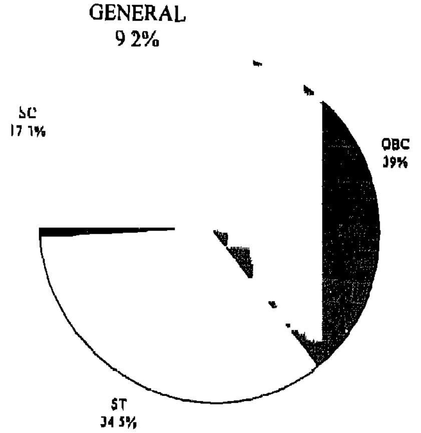

FIG. 1 . Categorywise Distribution of Children

Districtwise Enrolment and Dropouts

Table 3 indicates districtwise enrolment at the time of starting of AS, that after one year, i.e., in July 1996, the actual number of children present in the school at the time of surprise visit; and the dropouts in each district

TABLE 3

Districtwise Enrollment, Number of Children Actually Present at the Time of Visit of AS and Number of Dropout Children

S No.	*District*	*No. of AS Studied*	*No of Children Enrolled in (Starting of AS) 1995*	*No. of Children Enrolled till July 1996*	*No.of Children Actually Present at time of the Surprise Visit*	*No of Drop-outs*
1.	Betul	3	79	105	97	—
2	Dhar	8	234	309	160	11
3.	Raisen	7	191	271	113	9
4.	Rajgarh	7	373	378	260	11
5.	Rewa	6	103	179	150	16
6	Sehore	6	131	211	123	—
	TOTAL	37	1111	1453 (62 14%)	903 (3 23%)	47

Betul : Ten AS were opened in 1995-96. Three AS were selected for data collection (Thanimal, Sapna colony and Goledhana). At the time of visit of the investigators, all the three AS were found functioning with 36 children present in Thanimal, 21 in Sapna colony and 40 in Goledhana out of 36, 21 and 48 enrolled strength, respectively. The average attendance in these three AS was almost 100% throughout the year and there were no dropouts

Dhar : In this district, 30 AS were opened in 1995. Out of these, eight AS were selected for data collection. At the time when the AS were started, the number of enrolled children was 234 which increased to 307 in July 1996. At the time of the visit all the schools were found functioning but only 160 (67%) children were actually found present.

Regularity in schools is very important for learning and this point needs serious consideration of the teachers and other functionaries of AS. Eleven children dropped out from these AS in this district.

Raisen : In Raisen district, 20 AS were sanctioned but 19 AS could be opened. Out of these, 7 AS were selected for data collection. At the time of the surprise visits, one AS (Khoa village) was found closed while the other six were found functioning. When Khoa village was visited again after 15 days, the school was again found closed On sending a message to teachers and students, 20 children could come and data were collected In August 1995, the number of children enrolled was 191, which increased to 271 in July 1996, but at the time of visit the number of children was only 113 (41.6%). The number of dropout children in the district was 9, and the reasons for dropout were reported as unsuitable school timings and the migratory population.

Rajgarh : Twenty AS were started in this district and seven AS were selected for data collection. The number of children enrolled upto July 1996 was 378. But at the time of the visit, 260 (68.7%) children were actually present in these schools. The attendance report of the children indicated that the children were quite regular except for the AS at Badisewani where at the time of the visit only 8 children out of the enrolled 42 were present The number of dropout children was 11, and these dropouts were mainly from Badisewani.

Rewa : In this district, 20 AS were started and data were collected from 6 AS The total strength in these six AS in July 1996 was 179, and at the time of the surprise visit, 150 (83.7%) children were found present. The attendance record shows that in two AS (Mudriya and Paterishripat) the children were not regular as in these schools the teachers were not very serious about their duties and were not attending school regularly The number of dropout children was 16 in this district.

Sehore : Twenty AS were started in the district and six of them were selected for data collection. Two of these AS started late, i.e., in January and February 1996. The number of enrolled children was 211 and at the time of visit, 123 (58.2%) were actually found present. Except for the AS at Atroliya, all the schools were functioning regularly and there were no dropouts in this district.

Availability of Teaching-Learning Material (TLM)

Although TLM was supplied in 80% of the schools studied, it was not sufficient keeping the number of enrolled children in view. TLM is also not supplied in time as per the report of the teachers, inspite of the repeated requests by them

Opinion of Parents Not Sending Their Children to AS/Formal School/NFE Centre

Table 4 indicates various aspects of parents who do not send their children to any school. As regard, the categorywise distribution of such parents, it is found that 31% belong to SC, 25% to ST, 30% to OBC, and only 14% belong to the general category.

The analysis of educational qualifications indicates that the majority of such parents (52.7%) are illiterate whereas only a few (7.3%) have studied upto Sr. Secondary. Most of these parents are engaged in agriculture (69%), 21% belong to the labour class and only handful of them belong to the service class.

The parents were also asked to list the reasons for not sending their children to AS/NFE centre or formal schools. It is observed that 31% expressed non-suitability of the venue of AS, 25 5% stated non-suitability of timings of AS, 16.4% expressed co-education as the main reason for not sending their children to AS. 36.3% parents do not send their children to the schools as they help in supplementing the family income, 34 5% parents have said that education is not related to their needs. Some of the parents (10 9%) indicated that their children are afraid of the teachers.

In spite of the various reasons given for not sending their children to school, majority of them (71%) indicated their willingness to send their children to school while 19% of the parents were not at all willing to send their wards to the school.

TABLE 4

Opinion of Parents not Sending Their Children to AS/Formal School/NFE Centre (N·55)

Sl No	Item	Sub-Item	Betul	Dhar	Raisen	Rajgarh	Rewa	Sehore	Total	%
			District							
			1	2	6	6	6	6	4	
1	Category	SC	1	8	-	-	7	1	17	31 9
		ST	1	7	4	-	2	·	14	25 5
		OBC		1	1	-	11	3	16	29.0
		General	-	-		-	8	-	8	14.6
		Total	2	16	5	28	4	55	-	
2	Educational Qualifications	Illiterate		7						
		Primary pass	-		5	-	16	1	29	52.7
		Middle pass		9	-	-	2	2	14	25.5
		'Secondary pass	-		-	3	-	3	5 4	
		Sr. Secondary	1	-	-	4	-	5	9 1	
		Pass	-	-	-	3	1	4	7.4	
3.	Profession	Agriculture			5	-		38		
		Labourer	1	1	-	-		4	12	69 1
		Service and	1	3	-	-	8	4	12	21 8
		Other		-	-	1	-	-5		
		Professions			-	1		9.1		
4.	Yearly Income	Less than Rs 6000	2	13	5	-	15	-	35	63.6
		6000 to 9000	-	-						
		9000 to 12000	-	2	-	-	8	2	12	21 8
		More than 12000	1	-	-	-	4	2	7	12.7
			-	-		-	1	-	1	1.9
5.	Children between 6-14 years	Boys	2	13	7	1	39	3	64	52.9
		Girls	2	9	18	-	27	1	57	47 1
		Total	4	22	25		66	4	121	-

Opinion of Teachers, Supervisors and Community Members

Data were also collected regarding the opinion of teachers, supervisors and community members The problems mentioned and suggestions provided by teachers and supervisors are as follows

- Lack of suitable venue for AS;

- Untimely and insufficient TLM and other materials.
- No drinking-water for children.
- Midday meals should be provided.
- Lack of proper monitoring/supervision and guidance.
- Regular training is required for teachers and supervisors.
- Provision of vehicle for supervision.
- Enhancement of honorarium to teachers and supervisors.

(The salary of teachers and supervisors has now been raised to Rs 1000 and Rs 1500 per month, respectively).

Regarding the opinion of community members, the majority of them appeared quite satisfied with the functioning of the school in their area but most of them demanded a permanent school venue as in most of the villages the venue is not available. Such type of recommendations have come from teachers, parents and supervisors as well.

Some of the community members are giving a helping hand for the better functioning of AS by providing materials like pencils, slates, notebooks to the children. Some of them motivate the parents and even help the teachers in teaching and other activities. Some of the parents have also donated a piece of land for erecting a structure for the AS.

Conclusion

The analysis of 37 AS in six districts has been conducted very thoroughly. It reveals that the general performance of AS is quite satisfactory, especially in terms of enrolment and retention. In general, teachers, supervisors, parents and community members appear highly satisfied and enthusiastic about the project.

However, if the following points are looked into, there can be further improvement in the functioning of AS.

- Proper venue of AS;
- Regular supervision and monitoring;
- Timely supply of TLM in sufficient quantity;
- Regular training of teachers and supervisors;

- Selection of AS villages forming a project should be such that these fall within a radius of not more than 20 km. This will facilitate the task of supervisors and functionaries for monitoring the supervision.

Implication of the Study

The findings may help the planners and the users to improve multigrade teaching for universalisation of primary education in the country.

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10

CAPTURING THE PROCESS OF INDIGENOUS RURAL SKILLS FOR REVAMPING THE PEDAGOGY AT PRIMARY LEVEL

Baijayantimala Satapathy

The study aimed at identifying the rural indigenous skills of the Indians. The common skill acquisition processes needed to be introduced in the early stage of primary education to gear-up the hidden unique abilities of young children. After constant observation of the process of acquisition of skills, the common skill acquisition process was applied on children for teaching fractions in Class IV. Almost all children mastered the fundamentals of fractions. The findings of the study revealed that the acquisition of rural indigenous skill would help in revamping the pedagogy at primary level.

Introduction

India is a country with a glorious past. It has a rich cultural heritage and it is full of natural resources. Among these, the most important resources are the human resources. Actually, the rural Indians are hardworking people. There is life in the rural Indian homes. Most of the villagers are specifically skilled persons. Without going to any Institution the Indian boys and girls master the skills from the family; these skills are called life skills By practising these skills they earn their bread and butter. But now, due to the advancement of science and technology some rural indigenous skills are dying. Now these life skills are becoming dying skills.

It is a matter of great regret that today Indians are more westernized than indigenous The fashion of the day is to go away from the real Indian spirit.

> Vivekananda the great saint of India was of opinion· "Be an Occidental of Occidentals in your spirit of equality, freedom, work and energy, and at the same time a Hindu to the very backbone in your religion, Culture and Instincts" Always he wanted to combine Western progress with India's spiritual background The rural Indian skills are to be given due emphasis for the real progress of a great country like India.

Need of the Study

The need of the study is to attempt on the hidden unique abilities, i.e., the rural indigenous skills. More exactly the study aims at looking to the dying indigenous skills.

Some of the Indian rural skills are family trades. From the parents the child captures the skill-acquiring process and ultimately skilled himself/herself For this neither the parents nor the child have to go to any formal or non-formal educational institutions.

Though the skill-acquisition process sometimes involves some danger still the child acquires it. The parents successfully make their children skilled From a number of work the common processes of these skill-acquiring processes are to be highlighted.

These common processes are to be incorporated in the little children to gear up their hidden unique abilities, which can finally help in revamping the quality of primary education.

Methodology

The details of the methodology are given below.

Objectives

The study was undertaken to ·

- identify the indigenous life skills;
- observe the skill acquisition processes;
- ncorporate the common skill acquisition processes in teaching learning.
- tryout the common processes on a sample child population.

Instrumentation

Sample

(a) Five types of specific skills identified for the study are·

- Bamboo work by Damas
- Clay work — Potter (Kumhar)
- Straw work — A Girl
- Aplique work — A Girl
- Alpana — A Male Teacher

(b) 50 class IV students of George Primary school, Dhenkanal Municipality (within DIET Campus) are the student sample upon which the common skill acquisition processes are to be incorporated.

Tools

- Interview schedule for interviewing the skilled men at work
- Experimentation is also another tool for the students of Class IV

Methods of Skill Acquisition Process

Through field visit to the rural areas of Dhenkanal District some skilled persons were selected by the investigator.

She came in contact with the skilled persons. The investigator was overwhelmed with joy looking the unique life skills of these individuals.

By frequent visits, minute observation and direct interaction over a period of four months the investigator was able to identify some of the skill-acquisition processes These skilled individuals were interviewed and observed when they were at work.

Details of the Process

The detail process of skill-acquisition is given below :

Bamboo work by a specific Scheduled Caste community (DAMA)

By a constant and continuous visit to the rural village — Gunduripasi of Gondia Block, Dhenkanal District which is 30 km away from DIET Dhenkanal, the investigator was astonished to see the Bamboo work of the village men and women. This gave an insight to the investigator to go deep into the matter.

Then she started visiting a nearby village in the Dhenkanal Municipal area which is only five kilometres away from DIET, Dhenkanal.

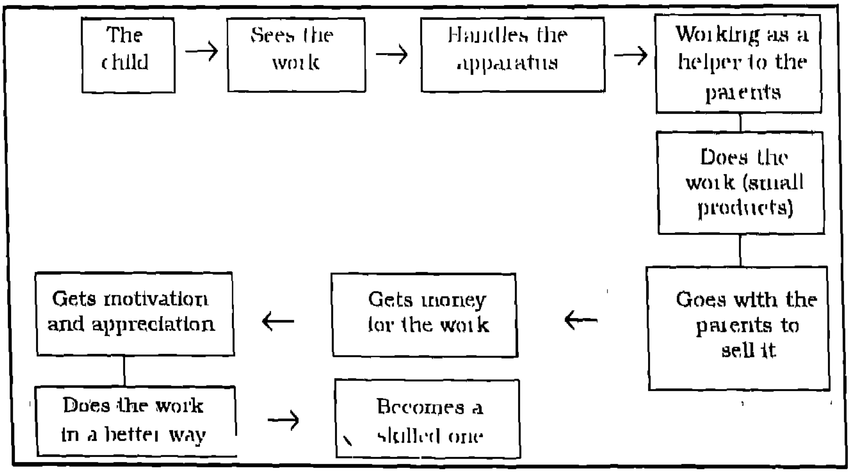
Everyday she started visiting that area, i.e. Damasahi, Hala Road, Dhenkanal. It was observed in that area that Bamboo work is a family trade This is the main source of income as stated by two skilled workers, Biranchi Naik and Jugal Nail. Everybody in the family does this work

As this is a family trade, from childhood itself the child sees the parents at·work. This is colorful work. The child, even from the crawling stage, sees this work being done, and sometimes takes away the coloured bamboo sticks, the small instruments like Katuri, the Ghodia, etc,. sometimes the child goes with the parents when they go to sell the products of their labour in the nearby villages.

This child now works as a helper and lends a hand to the parents. Here he gets recognition for good work. At any time if the child makes any mistake the parents rectify it without any hesitation. By this the child gets encouraged. The child in this process gets motivated and finally acquires the skill. He prepares small things like hand fan, flower bucket, etc., and goes with the parents to sell them. When the child directly gets some money for his/her own work, he/she develops interest in it and gets motivated to do more work.

During festive occasions even the child works the entire day along with the family members. Here the child feels the work is his/her own work. When the child produces a better product, everybody encourages the child This act as a re-enforcement for the child. The chart below will clarify the entire skill acquisition process

The Skill Acquisition Process — Bamboo work


The child
Sees the work
Handles the apparatus
Working as a helper to the parents
Does the work (small products)
Goes with the parents to sell it
Gets money for the work
Gets motivation and appreciation
Does the work in a better way
Becomes a skilled one

The child acquires the entire skill in the family.

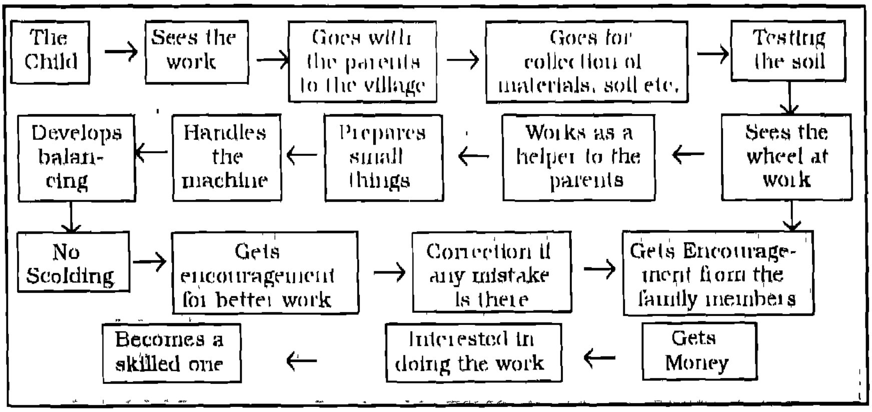
Clay Work by the Potter — A Specific Scheduled Caste Community — Potter (Kumhara)

The researcher visited the area where the potter (Kumhara) community lives. This is also a family trade. She met a number of families. But she was impressed with the work of Khageswar Behera. When interviewed, he narrated the process by which he had mastered this difficult task of pot-making from his father and grand father

Here also the child from his/her childhood sees all the members of the family at work. The child goes to the fields to collect the raw material, i.e., soil from the field. By constant touching the child learns the soil-testing process. The child sees the work in the *Sala*, i.e. the room where the entire clay work is done. Sometimes the child engages himself in churning the soil with the father or the grandfather. Then he sees how water is added to the soil to make a perfect paste of clay for the work. He sees the entire work — from this he knows when the clay will be ready to work.

Then he sees the working of the wheel and how the clay pots of various sizes are prepared. Balancing is one of the most important things which the child has to learn here. Sometimes, in the beginning, the child prepares small pots with the help of a frame. Here the child also works as a helper to the parents. While preparing the pots, sometimes the child commits some error. The child never gets punishment if he/she commits any mistake. The parents rectify the work so the child never feels harassed. For better work the child gets appreciation which acts as a reinforcement for the child. The child sells his tiny products with the parents and gets money and also appreciation. The appreciation encourages the child to involve himself in the work. Thus the child masters the family skill and ultimately becomes a skilled one and earns money even working at home.

The Skill Acquisition Process — Clay Work

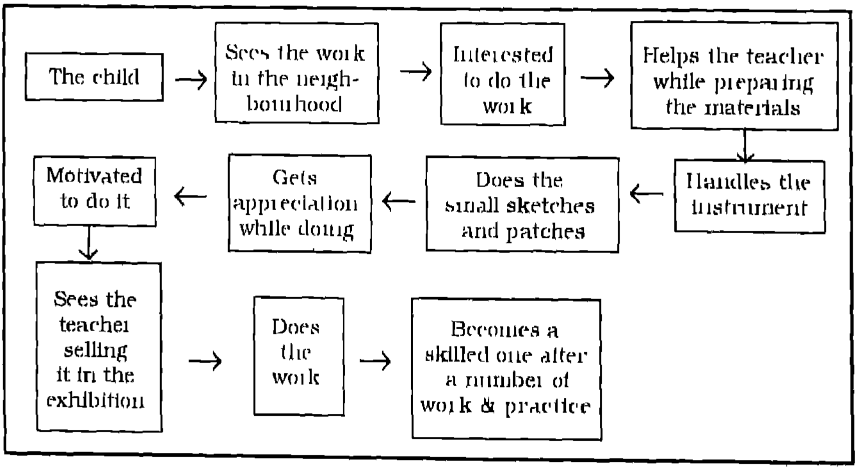

The Child
Sees the work
Goes with the parents to the village
Goes for collection of materials, soil etc.
Testing the soil
Sees the wheel at work
Works as a helper to the parents
Prepares small things
Handles the machine
Develops balancing
No Scolding
Gets encouragement for better work
Correction if any mistake is there
Gets Encouragement from the family members
Gets Money
Interested in doing the work
Becomes a skilled one

Straw Work — Art

This is not a family trade. Here a skilled girl — Itishree Hota — is teaching the art of making very good scenery, etc. to other girls. Without going to any formal or non-formal institution the girls master the process with straw from the rice plant. The students have to appreciate the art When the girls see it in their neighbourhood they feel doing it themselves. This appreciation of the work encourages the teacher to help the children acquire the process. First she asked them to collect the raw materials for the work, i.e., paper, piece of cloth, straw, gum

Then she draws the figure of Lord Ganesh on the board over a cloth She then helps them in pressing the straw, cutting, pasting etc. In the beginning the children work as a helper to the teacher-girl. Here the investigator observed one remarkable feature — that though this is not a family trade and the children are no way related to the teacher, still with a lot of patience she could teach the skill to others. After the entire work is over the final form of the picture is prepared. The children separately prepare their own product; they get appreciation from others; so they are motivated to do more in their leisure hours. The skill-acquisition process is given below ·

The Skill Acquisition Process — Straw Work


The child
Sees the work in the neighbourhood
Interested to do the work
Helps the teacher while preparing the materials
Handles the instrument
Does the small sketches and patches
Gets appreciation while doing
Motivated to do it
Sees the teacher selling it in the exhibition
Does the work
Becomes a skilled one after a number of work & practice

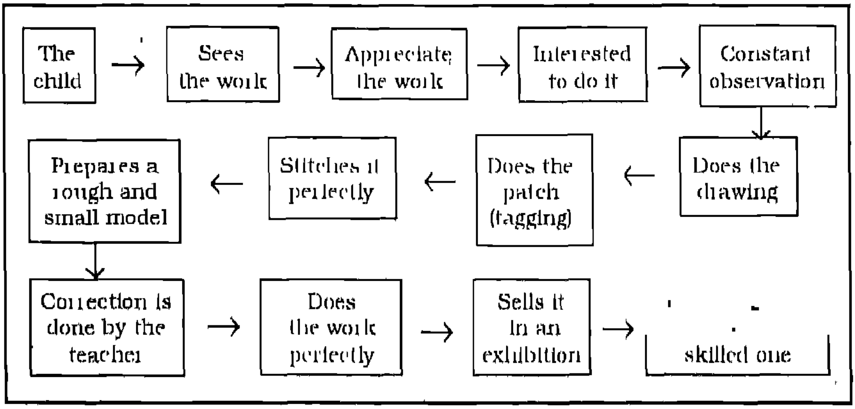
Applique Work or Patchwork or 'Chandua Work'

Applique work is a special type of skill where beautiful decorative needlework is done. Here pieces of one type of material, i.e., coloured cloth, are cut out and attached to another piece of cloth. Here in

Dhenkanal District this applique work is not a family trade. But the Teacher Girl, Jyotirmayee Satapathy, mastered the skill of doing it from others From her childhood, she was interested in doing all types of needlework.

This applique work of Pipili, in Orissa, has worldwide popularity. In Pipili of Puri District, this is a family trade. The child learns it from the parents. This is a colourful work. The 'teacher girl' taught this skill to other girls. The little children visiting the teacher's house appreciated the work and asked her to teach them the art of doing applique work. She agreed to teach them the process. Children sit with the 'teacher girl' while she is working and observe the work; while sitting they are to help the teacher and the elder girls in putting the thread in the needle, bringing the instruments, holding the cloth while the girls doing the stitching. These small girls do the small preparatory jobs. They get immediate recognition and appreciation for their work. Finally, they learn stitching and are able to do the work under the guidance of the skilled girls After a good deal of practice they will be able to master the skill The skill acquisition process is given in diagrammatic form below:

The Skill Acquisition Process — Applique Work



Though this is not a family trade, still the 'teacher girl' successfully able to teach the process to the small girls.

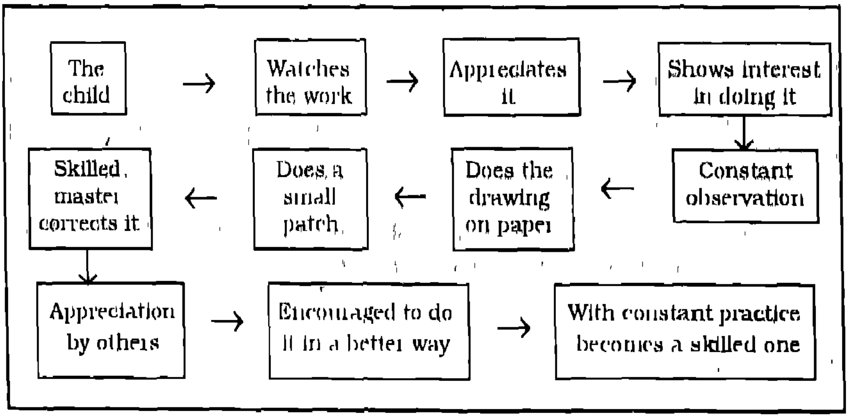
Alpana

This is not a family trade in the District of Dhenkanal. Still this is a process very much appreciated in India. This Alpana work is widely done all over the country. The raw material for this is ground white rice. Generally, the girls learn the skill of doing Alpana from the family. In the family the mother or other members do it very often In Andhra Pradesh and Tamilnadu this is done daily as a ritual. By constant observation the child gets motivated to do it on her own. She tries to do it. The mother allows her to do small sketches in the beginning ·The mother corrects the child if there is any mistake. When the work of the child is fine, the child gets recognition. Now the child gets encouraged to do it in a better way.

But the investigator was astonished to see that the skilled teacher, 'Chaturbhuja pradhan' selected for this study acquires the skill without any teaching. In interviewing the teacher the researcher was astonished to know that the teacher from his early childhood was eager to see any art anywhere. On festive occasions he devoted a lot of time to watching the Alpana made by the village girls and the female members in the families. Generally this Alpana work is done by the women folk. But out of his own interest the skilled-teacher could master it. He is a regular teacher in George Primary School but not an art teacher. But now due to his deep interest in the work, he is a skilled man in Alpana. He is also teaching that skill of doing Alpana to his Class IV and Class VI students of his school.

The investigator observed the art of teaching Alpana to the students and the process of acquisition of that particular skill by the students is given below. The photograph and picture (Annexures J and K) will clarify the process in a better way.

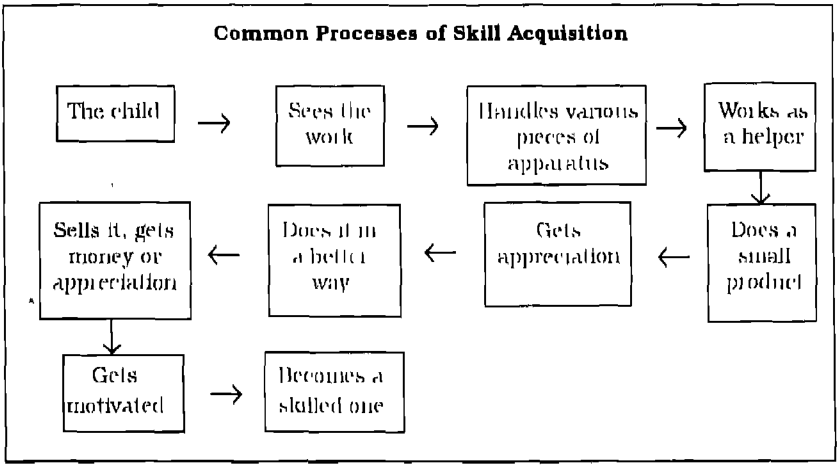
The Skill Acquisition Process — Alpana


The child
Watches the work
Appreciates it
Shows interest in doing it
Constant observation
Does the drawing on paper
Does a small patch
Skilled, master corrects it
Appreciation by others
Encouraged to do it in a better way
With constant practice becomes a skilled one

The Common Processes in these Five Types of Skills

The investigator after observing the skill acquisition processes in all the above five types of skills was able to find out the common processes therein These common processes are listed below

Common Processes of Skill Acquisition



Application of These Common Processes of Skill Learning in Teaching-Learning Process

After constant observation, direct interaction and face to face interview as above, the investigator thought deeply over the five skill-acquisition processes, and finally found out the common processes there in.

The investigator directly applied these common skill acquisition processes to the sample child population of Class IV students of George Primary School, which is located in the same campus where the District Institute of Education and Training, Dhenkanal, is situated.

She tried to teach the Class IV students a skill (skill of preparing 'Thunga' paper packet) with the skilled master, Mr. C. Pradhan She wanted to teach mathematics (Fundamentals of Fraction) to all the 50 children Again the investigator had in her mind that with this work the children can also learn something about General Science, Environmental Pollution, Art, Balancing, Team spirit etc. One of the most important thing the child would develop through this work was concentration

The Real Process of Work

One day the investigator along with Mr. Chaturbhuja Behera, Asst. Teacher, George Primary School, Dhenkanal who is also a skilled man selected as a sample for this study, started preparing 'Thunga' (Paper packet) in a classroom

All the students of Class IV saw it. After some time all the children were interested to do it by themselves

In the beginning they are told to do small jobs like cutting the paper into two equal halves, then in to four equal parts, then eight equal parts etc. All the children remain engaged in the work It was noticed that each child was taking a keen interest in doing the work.

The investigator and the skilled teacher allowed every child to participate in the process of 'Thunga making'. They allowed everybody to do the work. All of them did it nicely; where necessary, a little correction was made either by the skilled teacher or by the investigator.

While the work was going on, the investigator tried to intelligently answer the questions raised by the children. She also tried to test their knowledge.

Before the work, the investigator gave a pre-test to the student sample; from their raw scores the Mean and Standard Deviation of the pre-test were calculated.

After the 'Thunga preparation' work was over again on a fine morning the investigator had the post-test. Again from the raw scores, the Mean and Standard Deviation of the post-test were calculated.

From the two tests the 't' value was calculated and the level of significance was known. The table below will give a clear picture of the pre-test and post-test results and also the 't' value.

TABLE
Pre-test and Post-test Results with the 't' value

Pre-Test	*Post-Test*
Mean - 7.54 S.D. - 8.429 N = 50	Mean - 24.4 S D. - 24 423 N = 50
't' value = 4619	

From the above table it is observed that the performance of the children is remarkably significant both at 0 05 and 0.01 levels.

From this it can be concluded that if the common skill acquisition processes are to be successfully applied to primary level students they will show a better performance in their classroom achievement: also, they will be skilled in certain life skills in the future.

Major Outcomes

From the above study the following outcomes are observed

- To capture any skill the child has to see it first.
- The child has to feel the work as his or her own work
- The child will act as a helper
- The child should be allowed to share his/her hand in the work
- If any mistake is noticed the elder members to rectify it.
- The child should get money or appreciation for better work.
- By the above, the child gets motivated.
- After regular practice the child can master the thing and becomes a skilled one.'
- The same hold good in learning subjects in educational institutions.
- Proper care and help to the child in the elementary stage will make the child a skilled master in the future.

Implication of the Findings for School Effectiveness

From the above study of the skill-acquisition process it is observed that·

- The process of rural indigenous skill-acquisition has a direct bearing on children's mind.
- Certain life skills can directly be applied in the teaching learning process
- The life skills, if given proper recognition, will also help our little children in a number of ways.
- The common skill acquisition processes of such rural indigenous skills if applied at the primary level, will certainly help in revamping the pedagogy at the primary level

Recommendations

- The rural indigenous skills are to be recognised and the processes of skill-acquisition are to be applied in primary pedagogy for revamping the quality of primary education.
- The child, from the primary stage, should practise some life skills so that the primary education will help the children to be active and potentially useful members of the society in the future.
- A number of further researches may be undertaken in this field.

11

ACHIEVEMENT IN SCIENCE AND MATHEMATICS AS A FUNCTION OF LEARNING ORGANIZATION OF COMPETENCIES IN MATHEMATICS AT PRIMARY STAGE

K.K. Vasishtha; Krishna Kumar Madan

The study examined the influence of mastery/non-mastery of primary level competencies in mathematics on subsequent achievement of children in science and mathematics at Class VIII and Class X levels Twenty-four primary-level compencies emerged as real hard spots of learning for Class VIII students and eleven for Class X students. Of them 10 were judged to be common at both the levels Ability to use fractions, decimals and percentage was found to be the most difficult area for students of Classes VIII and X. The study also highlighted that highly significant positive relationships were found to exist between mastery/non-mastery of primary-level competencies and achievement in mathematics and science in Classes VIII and X

Introduction

Primary education plays a pivotal role in the lives of people as it lays the foundation of learning and equips them with basic skills for their survival both as individuals and as the members of society. Universalization of Elementary Education (UEE) has, therefore, assumed great significance and all out efforts are being made accordingly by the government and by voluntary organizations to achieve it by 2001 A.D. It is in this context that the National Policy on Education (NPE)-1986 had emphasized the need for laying down Minimum Levels of Learning (MLLs) for each stage of school education as a prerequisite for setting performance goals for students and teachers which could serve as effective guides for organizing teaching-learning experiences and evaluating pupils' achievement.

The first two parameters of UEE, namely, universal enrolment and universal retention, appear to have been achieved to a great extent. The third parameter of UEE, universal attainment, of course, remains a far cry as yet. This dimension of UEE relates itself to the quality of education. The quality variations become pronounced in certain States, between schools of rural and urban areas, between schools governed by government and non-government bodies, and so on.

Until now there has been stress on coverage of course content and group success has been valued It has resulted in the mastery of prescribed competencies by a small proportion of students only. Others have to be content with partial or no mastery of such competencies and keep on moving to the next stage of learning and to face a variety of consequences. The main reason for such happenings may lie in the fact that the educational system has been routinized to textbook-based teaching with total disregard to ensuring mastery of specified competencies prescribed for the particular stages of learning. The problem of non-mastery of specified competencies and low achievement continues to prevail at primary, upper primary and secondary stages. The policy of automatic promotion, with no room for remediation to overcome non-mastery, further aggravates the situation. Non-mastery of certain primary stage competencies may be noticed amongst pupils at upper primary and secondary stages, which may hamper learning of key concepts in mathematics in subsequent classes and may cause low and varying levels of achievement in mathematics and allied subjects.

The review of literature in the field of achievement in science and mathematics reveals that most of the studies conducted and designed in India and abroad have attempted to relate achievement with some of the pupil characteristics, school characteristics, SES, teacher's qualities, etc. Slight variations were observed in the strategies of implementation of the MLLs programme under various projects by agencies in India, although all of them had the cherished goal of quality primary education. Also, all these studies seem to converge on a point — that there seem to be problems in attainment of MLLs by all children at the level of mastery. As such learning gaps do remain during the formative years of schooling; possibly, these are not attended to in the late years of schooling as well Researches have indicated a direct and significant relationship between previous and later achievement of children Ideally speaking, this relationship ought to have been perfect if mastery learning was achieved in the previous grades No research evidence, however is available to prove or discard this assumption. The present study thus focusses itself on identification of hard spots of learning in mathematics at primary stage and studies the impact of their mastery/non-mastery on the achievement of students in science and mathematics at Class VIII and Class X levels.

Objectives of the Study

The following objectives were formulated for the present study:

- To identify 'Hard spots of learning' in terms of levels of mastery of MLLs competencies at primary stage by students of grades VIII and X as perceived by their teachers.
- To identify 'Hard spots of learning' for students of grades VIII and X on the basis of competency based achievement test on MLLs prescribed for primary stage
- To identify specific areas of mastery and non-mastery by class VIII and X students in the context of MLLs competencies in Mathematics at primary stage.
- To examine the extent of relationship between mastery/ non mastery of primary stage mathematical competencies and achievement of students in Mathematics at class VIII and X levels.
- To examine the extent of relationship between mastery/ non mastery of primary stage mathematics competencies and achievement of students in Science at class VIII and X levels.
- To identify specific areas of Mathematics learning and concerned MLLs competencies in Mathematics which exert significant influence on achievement of students in Science and Mathematics at class VIII and X levels.
- To draw some significant conclusions regarding alternative approaches to curriculum and its transaction at primary stage.

Hypotheses

Under the plan and procedure of the study the following hypotheses were formulated:

1. Teacher's perceptions about mastery/non-mastery of MLLs competencies may serve as good indicators for identification of critical hard spots of learning.
2. Criterion referenced mathematical ability test may help identify real hard spots of learning for students.
3. There exists significant positive relationship between mastery/non-mastery of MLLs competencies and achievement in Mathematics and Science at class VIII and X levels.
4. Certain areas of mathematical learning and competencies may be identified for arranging alternative strategy for curriculum transaction and renewal.

Methodology

The study has been conducted through Normative Testing survey method following a cross sectional approach. Since the study attempted to identify an alternative approach to curriculum transaction at primary stage, it was conducted in three phases.

1. Identification of the 'Hard Spots of Learning' through judgement of experts and teachers teaching Classes VIII and X, by employing the content-analysis technique.
2. Development of criterion referenced competency-based test on the identified critical hard spots of learning.
3. Establishing relationship between mastery/non-mastery of identified competencies with the achievement of students in science and mathematics at Class VIII and Class X levels.

The Sample

The population of the present study consisted of students of Classes VIII and X studying in government schools of the National Capital Territory of Delhi and their teachers. The samples were drawn through the cluster random sampling technique. First of all four educational districts were randomly selected out of 9 educational districts of the NCT of Delhi. Further, 2 to 3 schools were identified from each educational district. From each school a cluster of maths teachers teaching Classes VIII and X were taken up In all, 40 maths teachers (20 male and 20 female) teaching Classes VIII (20 teachers) and X (20 teachers) were included in the sample. Intact groups of students by choosing randomly one of the Hindi medium sections were taken as the sample so as to have 200 students each from Classes VIII and X during 1994-1996.

The Tools

(A) Teachers Perception Scale regarding mastery of MLL Competencies by students

(B) Criterion/competency-based mathematical ability test 'GANIT YOGYATA PARIKSHA', based on 50 competencies identified as critical hard spots of learning.

Procedure

First of all 207 MLL competencies in mathematics prescribed for the primary classes were got short listed by a panel of experts who in turn provided a list of 96 competencies of the primary stage which could be considered difficult even for Class VIII and Class X students in varying degress. Further, the perceptions of teachers teaching mathematics to Classes VIII and X were gathered on a five-point scale associated with each of these 96 competencies. This helped in identifying critical hard spots of learning on a 60 x 60 criteria, i.e., a critical hard spot of learning was the competency which has been considered to be mastered by less than 60 per cent students of Classes VIII or X in the judgement of more than 60 per cent of teachers. Such an exercise yielded 50 competencies as critical hard spots of learning on which criterion/competency-based mathematics ability test items were developed. The tests were administered to 200 students each from Classes VIII and X, and the results of mastery/non-mastery were correlated with their achievements in science and mathematics in the end-of-year examinations. The findings suggested a learning organization pattern to be adopted at primary stage, and hence provided for an alternative approach to curriculum transaction

Results and Discussions

Identification of Critical Hard Spots of Learning

For the present study, the MHRD document titled 'Minimum Levels of Learning at Primary Stage' (1991) and the study report of NCERT (1994) were referred to a group of experts to identify possible MLL competencies which could be considered as hard spots of learning even at Class VIII and X levels. The experts group provided a set of

96 competencies, which formed the basis for developing a Teachers' Perception Scale. The distribution of the MLL competencies (probable Hard Spots of Learning) is provided below in Table 1.

TABLE 1

Areawise distribution of MLLs competencies
(Probable Hard Sports of Learning aspect — experts' judgement)

Area of Learning Maths	*Class/No. of Competencies*				*Total*
	II	*III*	*IV*	*V*	
I	—	1	4	5	10
II	—	6	9	8	23
III	1	1	17	12	31
IV	—	—	7	13	20
V	—	2	6	4	12
Total	1	10	43	42	96

Area I : Understanding of Whole Numbers and Numerals
Area II : Ability to Add, Subtract, Multiply and Divide Whole Numbers
Area III : Ability to use and solve problems related to units of Money, Length, Mass (weight), Capacity, Area and Time.
Area IV : Ability to use Fractions, Decimals, and Percentage
Area V Understanding of Geometrical Shapes and Spatial Relationships

In order to obtain teachers' perceptions about expected mastery by Class VIII and Class X students on these 96 competencies, each competency was associated with a five-point scale attached to it, viz., expected mastery by 20%, 20-40%, 40-60%, 60-80% and 80-100% students of the class (VIII or X) under reference.

A list of competencies was compiled, which were reported as mastered by 60 percent or less in the judgement of 60 percent or more teachers. These competencies were termed as 'Critical Hard Spots of Learning' and were used for developing criterion/competency-based test for testing mathematical achievement. The areawise distribution of these critical hard spots of learning is given below in Table 2.

TABLE 2
Areawise Distribution of Critical Hard Sports of Learning as Perceived by Teachers

Area	*Class*			*Total*
	III	*IV*	*V*	
I	—	—	3	3
II	1	4	3	8
III	—	8	10	18
IV	—	6	12	18
V	1	—	2	3
Total	2	18	30	50

Criterion/Competency Based Mathematical Ability Test (GANIT YOGYATA PARIKSHA)

A criterion/competency based mathematical ability test named 'Ganit Yogyata Pariksha' was developed in Hindi, which initially had 100 items for 50 competencies. The test was tried out on a sample of 40 students each of Classes VIII and X, respectively. The suitability of items was judged on the criteria, (a) appropriate level of discrimination between Masters and Non-masters, and (b) comprehensibility of test items by the students. The final draft of the test had 50 items The split-half reliability for the test was estimated to be 0.93, and the validity of the test was ascertained in two ways: (a) Point Biserial Correlations across the areas of learning mathematics yielded significant values giving a general index of 0.496; (b) Point Biserial Correlations between mastery/non-mastery in individual areas of mathematical learning to the total scores ranged from 0.30 to 0.933, with all values being significant at .01 level of confidence These provided quite satisfactory measures of the internal validity of the test

Criteria for Mastery and Non-mastery of MLLs Competencies

Ideally speaking, mastery learning refers to mastery of almost all competencies by almost all the children (100x100). In practice, a near ideal situation of 80 x 80 is considered workable. For the present investigation, masters and non-masters were identified through the criteria stated as under

(a) Students securing 60 per cent or more marks on the criterion-referenced mathematical ability test were treated as masters in the mathematical competencies pertaining to the primary stage.

(b) Students securing 20 per cent or less marks on the criterion-referenced mathematical ability test were treated as non-masters in the mathematical competencies pertaining to the primary stage.

Identification of Real Hard Spots of Learning

Competencies showing achievement level of 20 percent or below for Class VIII and Class X students on the test were identified and termed as Real Hard Spots of Learning. In all, there were 24 such competencies for Class VIII students and 11 for Class X students. Ten competencies were common to both Classes VIII and X. Out of 24 real Hard Spots of Learning for Class VIII students, there were 1,4,6,11 and 2 competencies pertaining to areas I, II, III, IV and V, respectively. Classwise, eight competencies belonged to Class IV while 16 belonged to Class V. Out of 11 Real Hard Spots of Learning for Class X, there were 2,3,5 and 1 competencies pertaining to areas II, III, IV and V, respectively Classwise, 3 competencies pertained to Class IV and 8 competencies to Class V. The list of real hard spots of learning has been provided in Annexure 1.

Mastery and Non-mastery as related to Achievement in Mathematics and Science at Classes VIII and X

In order to establish relationships between mastery/non-mastery on competency-based achievement test and achievement in mathematics at Classes VIII and X levels, the number of masters and non-masters were identified as per the criteria stated earlier. The data in this regard are presented below in Table 3.

TABLE 3

Number of Overall Masters and Non-masters

Category of Students	*N*	*Masters*		*Non-masters*	
VIII Boys	100	21	23	24	77
VIII Girls	100	02		53	
X Boys	100	35	52	09	24
X Girls	100	17		15	
Total	400		75		101

The relationship between overall mastery/non-mastery on MLLs and corresponding achievement in mathematics and science at Class VIII and Class X levels was studied through Point-Biserial Coefficient of Correlation. The results obtained are summarized in Table 4.

TABLE 4

Point Biserial Coefficients of Correlation Showing Relationships between Overall Mastery/Non-mastery of MLLs in Maths and Achievement of Class VIII and Class X Students in Mathematics and Science

Category of Students	*N*	r_{phis}	
		Maths	*Science*
VIII Boys	45	0.602**	0.397**
VIII Girls	55	0.501**	0.457**
X Boys	44	0.841**	0.717**
X Girls	32	0.936**	0.776**

** Significant at .01 level of confidence

It may be noted from Table 4 that the obtained values of r_{phis} for mathematics ranged from 0.501 to 0.936 and for science, from 0.397 to 0.776. All these values are significant at .01 level of confidence. Further, it may be noted that sex differences were minimal in the extent of relationships both at Class VIII and Class X levels. It seems quite safe to assert that mastery/non-mastery of primary stage MLLs competencies has a direct bearing on the achievement of students both in mathematics and sciences at Class VIII and Class X levels. It may, therefore, be inferred that achievement in science and mathematics at Class VIII and Class X levels is a function of mastery/non-mastery of select primary stage MLLs competencies. That is to say, students (boys and girls) get proportionately benefited or penalized if they possess mastery or non-mastery over the said MLLs competencies at primary stage.

Further analysis yielded that areas of learning show differential influence on the achievement of students in maths and science at Class VIII and Class X levels. Areas of learning Mathematics could be ranked to show their relative impact on subsequent achievements in maths and science as shown in Table 5·

TABLE 5

Relative Impact of Mastery/Non-mastery in Areas of Mathematical Learning and Subsequent Achievement in Classes VIII and X

	Class VIII				*Class X*			
	Boys		*Girls*		*Boys*		*Girls*	
Rank	*Maths*	*Science*	*Maths*	*Science*	*Maths*	*Science*	*Maths*	*Science*
I	Area IV	Area IV	Area III	Area III	Area IV	Area IV	Area I	Area II
II	Area II	Area I	Area II	Area II	Area II	Area II	Area II	Area I
III	Area V	Area V	Area II	Area I	Area I	Area III	Area III	Area III
IV	Area I	Area III	Area V	Area V	Area III	Area V	Area IV	Area V
V	Area III	Area II	—	—	Area V	Area I	Area V	Area IV

Major Findings

1. Fifty primary-stage MLLs competencies were identified as critical hard spots of learning for Class VIII and Class X students as judged by teachers (Class III-2, Class IV-18 and Class V-30). Incidentally, 41 out of these 50 competencies figured as hard spots of learning in the NCERT study (1994).
2. Twenty-four MLLs competencies emerged as real hard spots of learning for Class VIII students while eleven such MLLs competencies could be identified for Class X. Ten competencies were common hard spots of learning for both Classes VIII and X (Please refer to Table B in Annexure I).
3. Area IV (ability to use fractions, decimals and percentage) of MLLs at primary stage was found to be the most difficult for students of Classes VIII and Class X.
4. On the basis of the number of hard spot, the areas of mathematical learning, in order of decreasing difficulty, were IV, III, II, V and I for both Class VIII and Class X students.
5. Highly significant positive relationships were found to exist between mastery/non-mastery on selected primary-stage MLL competencies in mathematics and achievement in mathematics for Classes VIII and X, respectively as the computed values of r_{phis} ranged from 0 501 to 0 936, and

all these values were found to be significant at .01 level of confidence Thus mastery of MLLs seems to lead to high achievement in maths in subsequent years and non-mastery acts as a deterrent.

6. Highly significant positive relationships were found to exist between mastery/non-mastery on primary-stage mathematical competencies and achievement in science for Class VIII and Class X in the end-of-year examinations as the r_{phis} values ranged from 0.397 to 0.776, and all these values were significant at .01 level of confidence Hence mastery of MLLs contributes positively towards later achievement in science and non-mastery gives a set back.
7. Sex differences were found to be non-existent so far as the highly significant positive relationships between mastery of MLL competencies and achievement in mathematics and science were concerned for both the levels, i.e , Class VIII and Class X.

Educational Implications of the Findings

1. Certain primary-stage mathematical competencies (MLLs) which have been identified as hard spots of learning may be practised to a greater extent in primary classes because non-mastery of these competencies leads to poor performance of students in mathematics and science at later stages of learning, especially, Classes VIII and X.
2. More stress should be given at primary level to the understanding of Area IV, Area II and Area III, especially Area IV that has been recognised as the most difficult area from all the angles of consideration.
3. Certain competencies, the common real hard spots of learning, which are not generally mastered by both students of Class VIII and Class X, may be shifted to higher classes, i.e., the upper primary classes.
4. Achievement of students at Class VIII and Class X levels in mathematics can easily be predicted by the mastery/non-mastery over selected competencies in mathematics at primary level. That is to say that mastery is an assurance of high achievement to a large extent and non-mastery leads to low achievement.

5. Achievement of students at Class VIII and Class X levels in science can also be predicted by the mastery/non-mastery over selected competencies in maths at primary-level That is to say that mastery leads to high achievement and non-mastery results in low achievement in science.

6. Class VIII teachers should evaluate the students, at the time of admission, for mastery on the set of 24 competencies which have been identified as the real hard spots of learning for Class VIII.

7. Class VIII teachers should give appropriate practice in the identified real hard spots of learning (competencies) and should see that these competencies are mastered by students much before they pass Class VIII.

8 Class X teachers should also evaluate the students, at the time of admission, for the mastery of the set of 24 competencies which are identified as the hard spots of learning for Class VIII.

9. Teachers teaching Class X must ensure that students gain mastery of all these 24 competencies identified as real hard spots of learning for Class VIII, and in particular, 11 competencies identified as real hard spots of learning for Class X, before they appear for the Class X CBSE examination.

10. Some of the competencies (MLLs) which have been identified as real hard spots of learning common to Classes VIII and X may be shifted to upper primary classes, or learning should be organized in such a manner that these do not pose problems at subsequent levels.

11 Special provision should be made with regard to dealing with real hard spots of learning (24 MLLs competencies), in the teachers' handbooks for primary stage teachers, and techniques of remedial teaching should be discussed in preservice and inservice training courses for teachers.

12. The primary stage curriculum needs to be rationalized in view of the findings of the present study, i.e., necessary adjustment may be made in specifying MLL competencies for a particular grade/age-level of students.

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ANNEXURE 1

(A) Real Hard Spots of Learning Mathematics for Classes VIII and X

S. No	*Compe-tency No.*	*No. of Students Answering Correctly Class VIII (N=200)*	*Class X (N=200)*	*Statement of Competency*
1	4.4.7*	04	23	Solves daily-life problems involving comparing, addition and subtraction of fractions with same denominator.
2	2.5.7*	09	26	Uses unitary method to solve daily life problems.
3	5.5.4*	11	15	Identifies whether a pair of simple figures are reflections of each other or not, and can draw the line of reflection if it exists.
4	4.5.12*	12	24	Finds required percentage of a given number or measure
5	3.5.5*	15	31	Solves simple daily-life problems relating to standard units of length involving up to 2 of the 4-operations with conversion.
6	4.5.13*	17	31	Solves simple daily life problems relating to standard units of length involving up to 2 of the 4-operations with conversion
7	4.5.8	18	—	Solves simple daily life problems involving application of percentage.
8	3.5.17*	19	28	Expresses units of length, weight and capacity in decimals upto 3 decimal places.
9	3.4.7*	19	35	Solves I step simple daily life problems relating to standard units of length involving conversion and only one of the 4 operations and multiplication and division by single digit only.
10	3.4.14	19	—	Converts litres to millilitres and vice versa.
11	3.5.9	23	—	Solves simple daily life problems involving up to 2 of the 4 operations relating to standard units of weight, with conversion.
12	4.5.7	23	—	Adds and subtracts decimals upto 3 decimal places.
13	2.5.9*	25	24	Finds the average height/score/..attendance etc. from the given data.

S. No.	*Competency No*	*No of Students Answering Correctly*		*Statement of Competency*
		Class VIII (N=200)	*Class X (N=200)*	
14	4 5.4	26	—	Solves daily life problems involving comparing, addition and subtraction of fractions and mixed numbers with denominator not exceeding 10
15	5 5 5	27	—	Identifies in two simple figures whether one can be rotated or turned to look like the other.
16	2.5.5	28	—	Solves 1-2 steps of daily life problems mentally involving any 2 of the 4 basic operations of addition, subtraction multiplication and division using not more than 6 digit numbers at any stage in the operations
17	4 4 1*	28	30	Demonstrates understanding of the meaning of proper fractions as parts of regions with the denominators not exceeding 20.
18	4.4.4	28	—	Arranges in ascending and descending sequence proper fractions with same numerators or same denominators.
19	4.4.8	30	—	Converts fractions and mixed numbers to decimals and decimals to fractions and mixed numbers, with value up to 2 decimals places.
20	4.5.3	36	—	Adds and subtracts fractions and mixed numbers with denominator not exceeding 10
21	2 4.10	36	—	Solves 1-2 steps of daily life problems mentally involving any 2 of the 4-basic operations of addition, subtraction, multiplication and division, using not more than 4-digit numbers at any stage in the operation.
22	1.5.7	37	—	Calculates HCF of two numbers not exceeding 100
23	4.5.6	37	—	Multiplies and divides 2 fractions with denominators up to 10 and express the answer in its lowest terms.
24	3.4.24	40	—	Adds hours and minutes with conversion.

Competencies marked with * were identified as real hard spots of learning for Class X. Besides these, another competency 4.5.11 (converts fractions and decimals into percentage and percentage into fraction in lowest terms and decimal) was also noted as a hard spot for Class X (response 26/200).

(B) Areawise Distribution of Real Hard Spots of Learning

Areas of Learning Mathematics	Competency Number of Real Hard Spots of Learning	
	For Class VIII	For Class X
Area I : Understanding whole numbers and numerals	1 5.7	—
Area II Ability to add subtract multiply and divide whole numbers	2.4.10.2.5 5, 2.5 7 2.5 9	2.5.7, 2.5 9
Area III Ability to use and solve simple problems of daily life relating to units of money length weight, capacity area and time	3.4 7 3 4.14 3.4.24, 3.5.5, 3.5 9, 3.5.17	3.4 7, 3 5 5, 3 5.17
Area IV : Ability to use fractions decimals and percentage	4.4.1, 4 4 4, 4.4.7 4 4.8, 4.5 3, 4 .5 4, 4.5.6 4.5.7, 4.5 8 4.5 12 4.5.13	4.4.1, 4 4.7 4.5.12, 4.5.13, 4.5.11
Area V : Understanding of geometrical shapes and spatial relationships	5 5 4, 5 5.5	5 5.4

Note: Competency numbers correspond to MHRD document, *Minimum Levels of Learning at Primary Stage (1991).*

SECTION IV

Activity Based Classroom Transaction

The studies discussed in this section include:

- The School Mathematics Project: Towards Freedom From Fear
- Learning Subject Specific Concepts Through Creative Activities
- Effect of Puzzle Programme in the Development of Cognitive and Creative Abilities Among Pre-School Children
- Activity Based Classroom Transaction . A Case Study

12

THE SCHOOL MATHEMATICS PROJECT : TOWARDS FREEDOM FROM FEAR

V. S. Varma

The School Mathematics Project Group in Delhi was formed in 1992 to understand the specific causes of the fear of mathematics in children and to move towards a curriculum that removes these causes. The findings revealed that initial work on any topic should be based on a variety of concrete to the oral, contextual mode to the symbolic and abstract. The study recommended that there should be as much emphasis on work related to shapes and patterns as on numeral work. Puzzles and riddles, collection and recording of data, discussion of errors and alternative strategies in problem solving, etc., might form an integral part of the mathematics curriculum.

Introduction

The School Mathematics Project came about as the result of a desire to do something to improve the teaching of mathematics in our schools. Of all the subjects taught in school, mathematics is the one which is most feared by children, particularly in the higher classes. It is also the single largest cause of failure at the middle and high school levels. Teachers in colleges and at university often feel that students have an inadequate grounding in mathematics. Many children seem to develop a phobia about mathematics particularly as they proceed to higher classes. Many adults declare, at times it would appear almost with some pride, that they never did well in mathematics and dropped it as a school subject at the first available opportunity — as if to tell the listener that they are smart enough to manage successful careers despite being mathematically handicapped. On closer examination it appears that such attitudes stem from early failures to comprehend what was being transacted in the mathematics classroom Such failures ensured that, given the hierarchical nature of the subject, the person never acquired the basic foundation that is essential for building later concepts. It is important, therefore to ·

- acknowledge that the present way of teaching mathematics, particularly in the primary classes, leaves something to be desired,
- understand the specific causes of the fear of mathematics in children, and,
- move towards a curriculum that removes these causes and improves the learning of mathematics.

The School Mathematics Project Group was formed in 1992 with the above objectives The group evolved as a unique mix of school and university teachers and persons engaged in research in education, working together as volunteers under the aegis of the Centre for Science Education and Communication in the University of Delhi. Some members of the group were involved in the development of the Hoshangabad Science Teaching Programme, others had worked with Prashika — the primary schools programme of Eklavya — and, most importantly, the group contained a number of persons who were actually teaching mathematics in primary schools. From April 1993 to March 1996, the project was supported by a grant from the Department of Education in the Ministry of Human Resource Development of the Government of India.

The group started its activities with a series of informal meetings in which it attempted to identify and examine the different issues that were involved in the task it had set itself and to work out a common group-approach. These meetings led to the group organising a national seminar entitled, "Primary School Mathematics — The Basis for Curricular Choices", in October 1993. The approach paper to this seminar noted that, 'While there is agreement on the need for an alternative curriculum, this tends to be at the level of very general statements like 'we should make the subject more interesting for students' or 'the curriculum should be more child-centered'. There is no consensus — indeed, there are conflicting views on what the curriculum should actually be like. The development of a curriculum based on principles that are tied to the structure of the discipline, to the modalities of classroom teaching, and to a model of how children learn mathematics is therefore a matter of some priority". The primary objective of organising the seminar was to share and learn from the experiences of other groups and individuals engaged in the challenge of developing new approaches to the teaching of mathematics in the primary school

Subsequently, contact was established with a number of schools in Delhi and another seminar was organised A series of material development workshops was held from April 1995 and surveys were carried out both of teachers' attitudes and of children's achievements before teaching according to a new, experimental, curriculum began in five schools Currently the programme is moving into the fourth school year.

The SMP Approach

Gradually, from all these interactions, the group evolved a common approach to the teaching of mathematics in the primary school As of today, our work in schools in informed by a set of shared perceptions about children, teachers and mathematics. These perceptions, collectively called the SMP approach, are outlined below:

- Children are not blank slates when they enter school. They come equipped with a certain awareness of number and operations ('initial mathematics') that is independent of formal instruction.
- There is a natural pace at which each child picks up new concepts and skills in mathematics. Riding roughshod over this in an attempt to maintain a pace of learning dictated solely by an externally imposed predetermined curriculum leads to the development of fear of mathematics.
- Children are individuals with their own pace and often their own strategies of learning. The curriculum should provide room for them to remain different. One method, one activity, one technique cannot provide for all children.
- Children are basically creative and eager to learn. They learn when they are actively engaged in what they are doing. The curriculum should have activities that engage children and it is important that these have a sense of play and of challenge
- Learning doesn't take place suddenly It is a slow process involving many loops and feedback cycles Children must have opportunities to use emerging concepts in as diverse situations as possible The curriculum must allow for creative repetition

to enable children to reconstruct and reconstruct concepts that they come across The school environment should provide a rich experience base for the child to make this possible.

- Mathematics is more than number and algorithms. It encompasses shape and space, patterns, structures, data handling and measurement
- Mathematics is inherently beautiful and a potential source of joy - only if the teacher feels this can she communicate it to children.
- Facility comes naturally when there is a meaningful context for mathematics.
- If the teacher is not convinced of the need for change, no curricular changes will work.
- Teacher training is not just a matter of training teachers in new concepts and techniques but of changing their attitude to mathematics and to teaching, especially in their relationship with children This cannot be done by imposition and may be possible only through involvement and association.
- The classroom process should not be viewed as a one-way transfer of 'knowledge' from the teacher to the taught. The emphasis should be on elucidation rather than on instruction
- Ultimately the teacher has to transact the curriculum in the classroom. It is neither possible nor desirable to spell out exactly how everything should be done. It is nevertheless necessary to provide the teacher all possible support
- Symbiotic notation is a powerful tool for computation and for keeping records However, familiarity with the symbol for something does not imply facility with the thing itself.

The implication of all the above is that initial work on any topic should be in the nature of elucidation and be based on a variety of concrete experiences. Suitably, chosen activities must form the backbone of classroom transactions The progression should be from the concrete to the oral-contextual mode to the symbolic and abstract. It also suggests that there should be as much emphasis on work related to shapes and patterns as on written numeral work. Puzzles and riddles, collection and recording of data, discussion of errors and alternative strategies in problem solving, estimation and developing a feeling for the magnitude of the correct answer in relation to numerical work should all form an integral part of the mathematics curriculum in the primary school. And the most important implication of all is that such a curriculum should only be developed in conjunction with and in continuous interaction with teachers who are actually engaged in teaching primary school mathematics, with feedback from the classroom constituting an integral part of such development.

Some Issues

As we have remarked, the programme is now about to enter Class IV. During this period the group has had to take positions on a number of issues related to the primary mathematics curriculum Some of these have already been spelt out in the previous section on the SMP approach. Let me describe some of the others so as to give a flavour of what our mathematics programme is about. Children should be encouraged to do mental arithmetic as it helps them internalise number facts. They should also be encouraged to do investigative work because it has been found that as a result they understand more, enjoy mathematics more and become more confident. The challenge here is to think of projects that are simple enough for children to undertake yet interesting enough to keep them engrossed. For example, on a chart with columns for the months, they could each be asked to stick a matchbox with their name written on it on the month in which they were born. At the end you would have a bar chart displaying how the birthdays of the children in the class are distributed during the year. They could at a later stage be asked to collect data on the minimum and maximum temperatures or the time of sunrise and sunset from the daily newspaper and display the variation of temperature or the length of the day with the seasons.

As another example, there is no reason why work with factor and multiples shouldn't start as soon as children are introduced to multiplication This can build on work done with even and odd numbers and can include the activity of finding prime numbers using the method of sieves. For this you need to take a list of whole numbers, say up to 100, and begin by crossing out all the multiples of 2, then all the multiples of the first number larger than 2 which remains uncrossed, i.e., 3. This is then repeated with the next largest uncrossed number, and so on. In the present case the process need not be repeated beyond multiples of 7 because the next largest uncrossed number at this stage is 11 and all the multiples of 11 less than 100 have already been crossed out. Children do not need to know the multiplication tables for this activity as they can use skip counting. The numbers in the list that remain uncrossed at the end, other than 1, are prime numbers — since they are not multiple of any smaller number

- Children should be encouraged to explain the ways in which they solve simple problems and to listen carefully to each other's explanations. This helps bring out individual methods and, more importantly, draws the attention of the other children in the class to the existence of ways different from their own of solving problems The problems chosen by the teacher should be such as to encourage the use by children of methods different from that involving the direct application of the usual algorithm. For example, she could ask, "if in a Bata shop a pair of chappals cost Rs.59.99 p, how much would you have to pay for three such pairs?" Some of the children may then find it easier to carry out the multiplication involved in the following manner.

  Rs. 59.99p x 3 = (Rs.60–1p) x 3 = Rs.180–3p = Rs.179.97p

- Errors made by children should be discussed in class as a matter of routine taking care not to offend the sensibilities of the child who has made the error. The purpose must always be to make children aware of the traps in which they can be caught. Children should also be encouraged to check their results either by using a different method or by using estimation to get an approximate answer. Thus if a child on multiplying 72 by 8 reports the answer to be 5616, he should be made to realise that the result must be wrong because the answer cannot exceed 80 x 8 = 640.

- To emphasis the underlying role of the place value system while introducing the multiplication algorithm and to explain to children why the extra zeros are added during the multiplication process, one should write it as:

$$\begin{array}{r l} 21 & \\ \underline{\times 35} & \\ 105 & = 21 \times 5 \\ \underline{630} & = 21 \times 30 \\ \underline{735} & \end{array}$$

- Also, the division algorithm when it is introduced, can be made somewhat more transparent if we write it as:

$$\begin{array}{rl} 3 & \\ 40 & \\ 500 & \\ \underline{1000} & = 1543 \\ 5\overline{)7715} & \\ \underline{5000} & \\ 2715 & \\ \underline{2500} & \\ 215 & \\ \underline{200} & \\ 15 & \\ \underline{15} & \\ \underline{0} & \end{array} \qquad \begin{array}{rl} 3 & \\ 40 & \\ 100 & \\ 400 & \\ \underline{1000} & = 1543 \\ 5\overline{)7715} & \\ \underline{5000} & \\ 2715 & \\ \underline{2000} & \\ 715 & \\ \underline{500} & \\ 215 & \\ \underline{200} & \\ 15 & \\ \underline{15} & \\ \underline{0} & \end{array}$$

This will work even if the division is not optimal at every stage as can be seen in the reworking of the division on the right-hand side.

- Let us conclude by talking of one of the most contentious issues in the mathematics curriculum in the primary school - fractions. The understanding of fractional numbers is, without doubt, an important step in the conceptual development of a child and the teaching of fractions should undoubtedly find a place in the primary school curriculum. This is not at issue. What is at issue, however, is how much should be done with fractions and when?

At a stage when children have just about become comfortable with the addition and subtraction of whole numbers and are still struggling with multiplication and division, the curriculum introduces these new objects on which they can also perform the same four basic operations. However, apparently the rules of the game seem to have suddenly become quite different. Thus the sum or difference of two fractions is not the ratio of the sum or difference of their numerators and denominators

$$\frac{a}{b} \pm \frac{c}{d} \neq \frac{a \pm c}{b \pm d}$$

as would seem natural to many children familiar with the addition or subtraction of whole numbers but involves first expressing both fractions with a common denominator, using the concept of equivalent fractions and then adding only the numerators, i.e.

$$\frac{a}{b} \pm \frac{c}{d} = \frac{a \times d}{b \times d} \pm \frac{b \times c}{b \times d} = \frac{a \times d \pm b \times c}{b \times d}$$

This is particularly confusing because the rule for multiplication of two fractions seems to remain the same as for the multiplication of two whole numbers, i.e.,

$$\frac{a}{b} \times \frac{c}{d} = \frac{a \times c}{b \times d}$$

and the confusion is worse confounded by

$$\frac{a}{b} - \frac{c}{d} = \frac{a}{b} \times \frac{d}{c}$$

We believe that failure to understand how to deal with fractions is a major reason for children developing a fear of mathematics. Of course, operations with fractions should be taught to children but not at the age it is usually done in the conventional curriculum. It should be delayed by at least a year. Children will then be in a better position to understand the techniques involved. However handling numbers which are not whole need not be postponed because this can be done by introducing decimals. The great advantage that decimals have over fractions is that the algorithms for operating with decimals are simple extension of the corresponding algorithms for integers and therefore easier for children to learn. Thus, after introducing simple fractions like $^1/_2$, $^1/_4$, $^3/_4$, $^1/_3$, $^1/_5$, etc through a variety of activities, one should introduce $^1/_{10}$, $^2/_{10}$, ... i.e., tenths or fractions with 10 as denominator. One can then introduce the decimal notation by extending the place value system to the right with the decimal point being used to mark where the unit place occurs. It is important to reiterate that a large number of activities using the abacus, the number line, the place value system and measurements of length using a scale divided into centimetres and millimetres need to be done to make this successful. The activity should also involve addition and subtraction of numbers with one place beyond the decimal point. One must then progress to numbers involving two places after the decimal point and introduce the operations of multiplication and division on such numbers.

Thus, in the alternative scheme that we are proposing, the introduction of operations with fractions is delayed till children are at least a full year older and, correspondingly, that much more mature They are then more likely to understand that the rules for operations on fractions are consistent with the rules for whole numbers and decimals. We believe this will lead to greater understanding, better performance, less frustrations and a consequent reduction in the fear of mathematics among children - goals we would all dearly wish to achieve.

13

LEARNING SUBJECT SPECIFIC CONCEPTS THROUGH CREATIVE ACTIVITIES

Jaya Shankar Padhi

The study explored some novel methods of organising learning concepts Sixty learners of Class II of D.M.School, Bhubaneswar were studied by organising learning concepts to different subjects in blended form for creative activities The study revealed that the divergent abilities of the learners increased gradually from Activity1 to Activity 5 in both the teacher-supervised and the unsupervised session. The study further brought out that the learners were self-motivated and were engaged silently in their own individual activities during the non-supervised period.

Introduction

There has been a long history of experimentation, development and research in organisation of learning content across the world with the result that the field now requires definite answers. In India, a large number of attempts have been made in this regard by curriculum framers, educationists, teachers and researchers Inspite of all these attempts, education is under attack. The NPE-1986 remarks. "The country has placed boundless trust in the educational system The people have a right to expect concrete results" (para 7.2). It is said that education has failed the aspiration of the people. The system has multiplied itself in magnitude but the quality has run down, disparities have grown large and widespread. Obviously, the issue is organisation of learning content that relates to what happens or what should happen in the school and in consequence decides the quality of schooling.

The existing state of learning organisation is well known. The entire curriculum transaction is built around the textbook. Our classroom teachers are mostly rule-bound, rigid and authoritarian. They give importance to correct unimaginative solutions to problems, expect execution and report in the prescribed manner, forbid spontaneity, reward mediocrity, crush joyful inquisitiveness in young children, ask for structured and closed-type answers written in the book. In essence, the existing learning is text-bound and affects development of a narrow range of abilities in our children

A Rational Approach

If education is required to obtain certain goals then a rational approach to the problem is essential. The theory of creativity, as it has emerged during the last few decades, offers an alternative approach that appears natural for development of a wide range of abilities.

Creative thinking is the greatest asset of a human being, and it is being neglected in our schools. Creative talents are not nurtured in our schools, especially in large-sized classes and multigrade settings. The apathy towards creativity may be due to· (i) the weakness of an average teacher, (ii) lack of research in developing teaching techniques, (iii) rigidity in the education system, and (iv) failure in the administration in diffusing new methods (Kothari Commission, 1966). Experts are of the view that subject related creative activities ensure joyful, and effective learning and develop divergent productive thinking abilities among the children. To substantiate this view, a variety of techniques and programmes have been developed for effective learning and enhancing creativity. The productive thinking programme is one amongst them. Productive thinking is the process of successive restructuring of a concept. In this, a thinker is led to restructuring of the concept Successive restructuring occur until a solution emerges. It includes imagination, problem-solving, even logic, and uses these to bring forth something that has never existed before.

In view of the above facts, the investigator has attempted this study as described below.

Objectives

The major objectives of the study were.

- To organise learning concepts of different subjects in blended form for creative activities;
- To develop divergent productive thinking in learners through these activities;

- To help the learners for attaining subject related concepts through these activities; and
- To train the learners for carrying out independent thinking activities.

Sample

Sixty pupils (36 boys and 24 girls) of class II studying in D.M.School, Bhubaneswar, Orissa, constituted the sample of the study.

Procedure Followed

- At the outset, five blended concepts included in the school subjects in Class II were identified. The concepts related to different subjects and the aims of the creative activities are shown in Table 1.

TABLE 1

Concepts of Subject Areas and Competencies to be Developed

	Concept	*Subject Area*	*Aims of the Creative Activity*
1	Word Making	Language	Learn to make words
		Env. Studies	Frame words of EVS & draw picture
		Mathematics	Count number of words in 2's
		Art Education	Drawing pictures
2.	(a) Food Items and	Language	Write names of the figures
	(b) Human Body Parts	Env. Studies	Identify and draw figures
		Art Education	Draw the figures/decorate the figures
3.	Mathematical Symbols	Mathematics	Explain meaning of symbols
		Env. Studies	Road signs
		Art Education	Complete the lines into figures
4.	Materials	Language	Improve word vocabulary
		Environmental Studies	Classify natural and man-made materials
		Mathematics	Distinguish heavier and lighter materials and
		Art Education	Draw and colour the picture
5.	Conservation of Resources	Language	Write simple sentence
		Env. Studies	Conserve and use of materials

On the basis of the above planning, different concept-related creative activities under the supervision, and without the supervision, of the teacher were prepared. The creative activities for learning concepts under supervision and self-activity (without teacher) are presented in Table 2.

TABLE 2.

Creative Activities Conducted in Supervised and Unsupervised Situations

Examples	*Creative Activities*	
	Teacher Supervised	*Without Teacher*
1. Word Making		
Pupils were asked to tell three or four letter words starting with B or C related to EVS.	Pupils were asked to write as many words starting with D or F.	Pupils were asked to draw pictures of the words written by them related to EVS
Teacher also added some more words to make pupils understand the game.	– 15 minutes time allowed	– No time-limit
2. Food items		
Some circles of equal size were drawn on the blackboard and the pupils were asked to draw pictures taking circle(s) as an element. The teacher helped them in doing the task.	20 circles drawn on a paper were given to the pupils and they were asked to draw as many food items keeping circle(s) as element, and name them. 20 minutes time allowed	A sheet of paper containing 20 circles were given to the pupils to draw as many human body parts as possible keeping circle as a part of – No time-limit.
3 Mathematical Symbols		
Pupils were asked to write meaningful symbols using two lines. Teacher helped them to understand by giving examples.	Using two or three straight lines, to write mathematical or geometrical symbols and as many road signs as possible – 10 minutes time-limit	i) Pupils were asked to write meanings of symbols and write examples using each symbol. ii) To construct picture or figures using two or three st lines as components. – No time-limit
4. Materials		
Pupils were made to know about biological, natural and man-made materials	i) Pupils were asked to write as many man-made and natural materials as they could – 10 minutes time given. ii) Asked to arrange materials in order of heaviness	To draw the pictures of man-made and natural materials separately and colour them.
5. Conservation of Resources		
Teacher asked the pupils to tell as many [illegible] possible in which a stone could be used The teacher helped in the process to add responses	[illegible] were asked to write [illegible] ways the waste water at home or environment could be used – 15 minute time-limit	[illegible] write [illegible] possible use of [illegible] notebook — No time-limit.

- The teacher initiated the activities giving instructions as follows. "Today let us play some interesting games. They will give you a chance to use your imagination. Remember, this is not a test. There is no wrong or right answer . . .So work on your own and let us see how many ideas you can think of. Feel free to give as many responses as you can Give those kinds of responses which nobody else in your class can think of giving. Make your responses clever and interesting. In case you run out of ideas do not give up. Continue to think and you may have some more ideas which you can add to your list Try to work as fast as you can."

The environment was joyful in a game-like situation for eliciting divergent, productive and new thinking for each activity. Emphasis was given to thinking of all the things in the world around them.

- Pupils were provided sufficient time for learning each concept and carrying out independent activities with novel ideas. It was ensured that each pupil could follow the directions, understood the task to be undertaken and the way responses were to be given. Therefore, for each creative activity, the sequence 'Example-Teacher supervised activity-Teacher unsupervised activity' was followed.
- During the experiment, the teacher encouraged self-thinking and free flow of large number of unrepetitive, flexible and uncommon responses of the pupils. Whenever any new ideas were shown by the pupils, they were reinforced. The pupils were instructed to carry on their thinking even after the school hours.

Results

The responses given by the pupils in all the five activities were scored for number of correct responses (fluency), classes of responses (flexibility) and their uncommonness In view of the objectives specified earlier, the data obtained were analysed.

Development of Divergent Productive Thinking

In order to study the above objective, each activity had 10 flexibility categories of responses and the responses were given flexibility category numbers according to their belongingness. The flexibility score of a pupil for each activity was calculated on the basis of number of classes of responses The mean scores of all the five activities under teacher-supervised and unsupervised sessions were computed. The divergent thinking score is equated to the flexibility score as assumed in the experiment. The mean divergent thinking scores are presented in Table 3.

TABLE 3
Mean Divergent Scores of the Concepts (N = 60)

	Concept	Teacher Supervised	Teacher Unsupervised
1.	Word Making	3.21	2.34
2	Food Items and Body Parts	3.18	3.02
3.	Mathematical Symbols	4.35	3.64
4.	Materials	5.08	4.01
5.	Conservation of Resources	5.84	4.38

Table 3 reveals that the mean divergent thinking score gradually increases from concept 1 to concept 5 This means that the divergent thinking of the pupils increase when the creative activities are conducted in the class. The teacher supervised activities are mostly verbal and unsupervised activities are figural in nature. There is less figural divergent thinking in the pupils in comparison to verbal thinking. This may be due to slowness in drawing pictures and colouring them. Fig. 1 depicts the trend in development of divergent productive thinking from activity 1 to 5 in both supervised and unsupervised sessions The mean divergent thinking score in the under former session (Mean-1) is found to be better than in the latter sessions (Mean - 2). The trend is similar in both the situations.

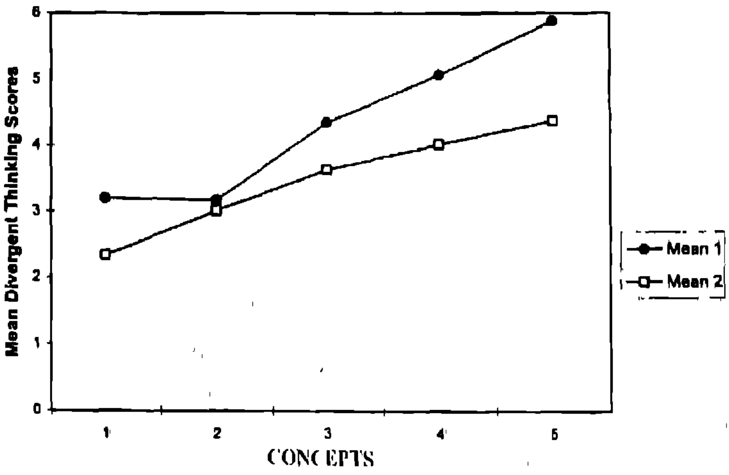


Fig. 1. Mean Divergent Thinking Scores

Concept Learning Through Creative Activities

To study the extent of attainment of concepts through the creative activities, criterion levels of each concept in terms of correct responses in both the situations (teacher supervised and unsupervised) were fixed. The criterion levels were fixed on the basis of mastery-level attainment and difficulty level of the task. The responses given by the pupils in both verbal and figural activities were scored for their correctness. Each correct response was allotted 1 mark, termed as 'fluency score'. Judgement of masters and non-masters were made on the basis of attaining the criterion level of the concepts. The percentages of attainment of mastery in both the situations are shown in Table 4.

TABLE 4

Percentages of Masters (Concepts Learned) of the Concepts

	Concept	*Teacher Supervised*	*Teacher Unsupervised*
1	Word Making	76,3	58 4
2.	Food Items and Body Parts	85,6	61.2
3.	Mathematical Symbols	79 4	68.0
4.	Materials	72,0	60.00
5.	Conservation of Resources	82,4	81.2

Table 4 reveals that in teacher-supervised sessions, in the concepts 'food items' and 'conservation and resources', the pupils have attained 80% criterion fixed for the verbal fluency. In the other three concepts, though they have not attained the mastery level (80%), they are approximate to the criterion level. In unsupervised sessions, the concept 'conservation of resources' to the criterion level. In other activities, learning is not that satisfactory. Of course, the performance of the learners is appreciable. It can be inferred that the pupils performed better under teacher-supervision and in verbal activities. n figural activities, the pupils are bit slow in giving responses, and that too in unsupervised sessions. The reason may be that the pupils are not conversant with such divergent thinking activities and the inertia can be removed with prolonged and well- planned activities. Fig 2 indicates the percentages of the pupils who mastered the concepts separately in teacher supervised and unsupervised sessions

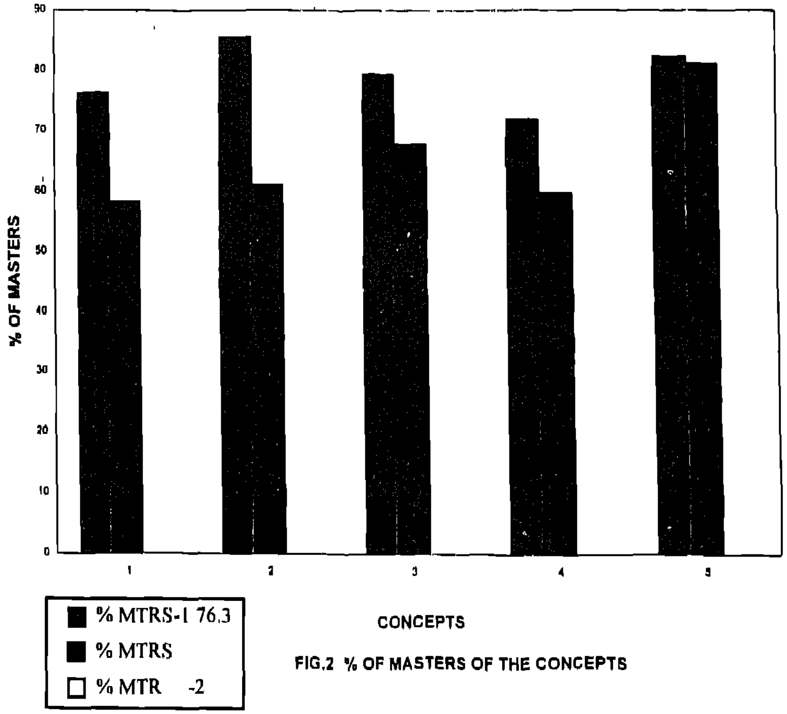


Fig. 2 Percentage of Masters of hte Concepts

Pupils Carry Out Independent Activities

One of the objectives of the study was to train the pupils to carry out their learning activities independently. Suitably prepared and well-administered creative activities make pupils self-motivated, self-reliant, and self-confident. This helps them to carry on their learning activities without help and supervision.

It is found that the pupils were ignorant or not trained to do independent activities and unsupervised activities at the beginning. About 47 (78%) of the pupils needed initial help and guidance for self-thinking, self-motivation to diversify their thinking in all the directions When the experiment continued, the pupils got trained gradually in doing what was expected of them. Towards the end of the experiment, it was found that about 10(17%) pupils still needed guidance to carry out their own learning activities. The other 50 pupils were trained to a large extent to respond to these creative activities on their own It can be inferred that if more creative activities are conducted and become a part of the teaching-learning process, almost all the pupils will be trained to carry out learning activities

Major Outcomes

These are some of the major outcomes of the study :

- Learning concepts of various school subjects could be blended and integrated to form conjugate concepts. Appropriate creative activities (verbal and figural) could be planned for the class for attainment of concepts. The creative activities were meticulously developed sequenced and conducted.
- Divergent productive thinking in the children was developed (verbal and figural) gradually from activity 1 to activity 5 Development of verbal divergent thinking is more in comparison to figural divergent thinking. The increasing trend may continue for some more activities, if conducted.
- Pupils have learned the concepts up to a fixed criterion level or approximate to that in both verbal and figural activities. The deficit may be due to initial inertia, ignorance, or may be inappropriate criterion level.
- More learners were gradually self-motivated and were engaged silently in their activities even during the non-supervised period.

Implications of Findings for School Effectiveness

The outcomes of the study have the following implications for the school effectiveness:

- The school curriculum can be reorganised in terms of creative activities. If this is implemented, the teacher becomes resourceful - he develops his own abilities and activities to prepare creative activities to obtain divergent productive responses: he uses familiar waste objects as a teaching-learning medium, and he plays the role expected of him.
- The pupil gives voluntarily a large number of responses that are flexible and uncommon and may be new to the group. He draws a number of pictures and figures of his own interest.

There is free flow of ideas for a longer time from a free mind and there is a free hand for the pencil that, with no wrong or right answers, deals with concrete and friendly items; he develops self-confidence, and is motivated for self-learning and independent thinking in them.

- Learning environment becomes game-like, enjoyable, self-paced and learner centered. The pupils are self-motivated so that their divergent thinking continues even after school hours.
- Looking to the characteristics of large-sized classes, this strategy seems to be more appropriate. Individualisation is taken care of and the teacher is less pressed. In the multigrade situation, where the teacher runs short of time, unsupervised time for one class can be utilised for supervision of other classes.

It can be concluded that implementation of creative activities for learning concepts is more useful for large-sized classes and multigrade situations. Their operationalisation may be studied on a larger scale.

14

EFFECT OF PUZZLE PROGRAMME IN THE DEVELOPMENT OF COGNITIVE AND CREATIVE ABILITIES AMONG PRE-SCHOOL CHILDREN

N. Shakunthala Manay; Shobha Rani T.C.

The study was undertaken with the objective of developing low-cost educative puzzles based on Indian culture in an hierarchical order to test their effectiveness in the development of cognitive and creative faculties. The results revealed that the experimental group performed significantly better than the control group when the complexity of the task increased from very simple to highly complex. The findings of the study revealed that the puzzle programme had been highly successful in developing the cognitive and creative faculties of the children which is for them to grow into wholesome beings.

Introduction

Pre-school is a crucial period when babyhood is being terminated and the child is being prepared for life through formal schooling. The importance of pre-school education and its informal teaching method has been emphasised right from 1966 in the Kothari commission, later in the National Policy of Education (1986), and recently in the Yashpal Committee report of 1993. Yet pre-schools of the present day do not meet the minimum specification set by the National Council of Education Research and Training (NCERT) in 1992 with regard to the physical structure and facilities, equipment and material, etc.

Need for the Study

Sri Aurobindo observed the importance of left and right brain faculties as early as 1910 : "The left brain limits itself to ascertain truth, the right brain grasps that which is elusive. . both are essential to the completeness of the human reason... if the education of the child is not to be imperfect and one sided" (Sri Aurobindo, 1971).

Educationists, at present, have taken up studies on the left and right brain faculties; for example the studies of Clark (1986), Williams et al (1984) and Deshmukh (1985), have all been towards integrating both hemispheres in children's education.

To draw spontaneously the resource and potentialities of the child through the playway method in teaching and learning, play materials are necessary to make play a fruitful activity. The importance of these play materials has been emphasized in experiments conducted by Skinner (1943) and Karen et,al (1995).

To keep the system of national education in true spirit as pointed by Sri Aurobindo, the present study was undertaken to develop the Puzzle Programme with puzzles which are of low-cost materials. These puzzles can be manipulated to develop whole brain and make learning a process of joy and fulfillment.

Methodology

Research Design

The research design undertaken for the present study was the pre and post-test design. A pre-test was administered to both the experimental and control groups. The puzzle programme was given to the experimental group to determine the effectiveness. Later a post-test was administered to determine whether any noticeable change took place in the experimental group as against the control group.

Objectives of the Study

The objectives of the study are stated as under:

- To develop puzzles which are low-cost and are of high educative value
- To arrange the puzzles in an hierarchical order, from simple to complex task
- To emphasise the basic Indian culture with suitable rhymes.
- To find out the effectiveness in the development of cognitive and creative ability of the children

Development of Programme

An intensive study of the related literature on child development, psychology and education was made by the investigator and she was able to develop about 45 puzzles The puzzles developed were subjected to judgement by experts coming from the areas of child development, psychology, sociology and education, to find out the suitability of the objectives of the study.

Based on the opinion of the experts the number of puzzles were finally reduced to 42 puzzles, and these arranged in an hierarchical order, from very simple to the complex task. The puzzles were adapted to rhymes and charts to suit Indian culture.

Tools Used

Two tools were used to collect data· (i) Rating Tool (ii) School Index

1. *Rating tool* : The Rating tool was prepared based on the information available from the following sources :
   - The diverse programmes with variety in principle and practice used by early childhood education in the United States of America (Parker and Day, 1978).
   - Implications of teaching and learning that emphasize relationship between the growth process of children and the educational setting (Lorton and Wally 1977).
   - The national norms of development of Indian children, using Gesell's items, prepared by NCERT (1970)
   - "How children learn and teaching implications of Piagets research" and "childs stages of development" as followed by Copland (1979)
   - Shishu Srinatmak Pariksham (1993) test of creativity (Verbal and Non-Verbal) by Singh.

From the above, the Rating tool was prepared, which dealt with concepts of shape, color, size, alphabet, recitation, mathematical concepts and creativity.

The reliability of the tool was prepared using the test - retest method. The reliability score was obtained using the statistical formula; it ranged between 0.85 to 0.89

2. *School Index* . A list of pre-schools was prepared by the investigator in the city of Bangalore. They were then classified

into High Grade Schools as "A" and Low Grade Schools as "B" based on the minimum specification specified and prescribed by NCERT (1992)

Selection of Sample

Eight pre-schools were randomly selected, out of which four each were from grades 'A' and 'B' Further, two pre-schools out of four pre-schools each grade 'A' and 'B' were randomly selected and these were identified as Experimental group and Control group.

The total number of children in the sample group were 240 (with ages ranging between 30-36 months) comprising 120 from the Experimental group (60 boys and 60 girls) and 120 from the Control group (60 boys and 60 girls). The matching of the samples were made with respect to the sex and the type of schools included in the study

Assessment Procedure

During the assessment of children in pre and post-test, the children were exposed to 42 puzzles. The performance of the children in the cognitive and creative aspects was assessed.

Analysis of Data

The data obtained by the experiment were duly tabulated and statistically analysed using 't' test, and tested for significance. Specific directions for conducting each task, e.g., Matching, Identification, Naming, Seriation, Recitation, Sequential Thinking, Counting and Creativity Concepts was worked out. Test materials were used to measure various concepts.

Rating

While rating a weightage of 33,2,1 and 0 scores was assigned, depending on the performance of the child by the investigator and the teacher. Inter-score reliability was calculated, a higher score indicating favourable performance

Results and Discussion

Table 1 presents the pre and post-test mean scores of children of Experimental and Control groups with respect to matching of basic shapes.

Basic Shapes

In the case of 'A' and 'B' schools with respect to matching of basic shapes, ability to match, the Experimental group exhibited a better pre-test score, compared to the Control group; this revealed non-significant result

TABLE 1
Performance of Children on Matching of Shapes

Matching of Shapes	*Groups*	*Type of School*			
		A		*B*	
		Pre-Test Mean	*Post-Test Mean*	*Pre-Test Mean*	*Post-Test Mean*
1 Basic Shapes (Very Simple Task)					
a) Ability to Match	E	1 69 NS	3 00 NS	1.37 NS	2.68 NS
	C	0.78	2.68	1.30	2.72
b) Ability to Match no. of puzzle pieces	E	2 17 NS	2.92 NS	1 41 NS	2.91 NS
	C	2.10	2 80	1.38	2.78
2. Bilaterally Symmetrical Shapes (Medium Task)					
a) Ability to Match	E	0.80 NS	2 92 *	0.37 NS	2.86 *
	C	1.67	2 62	0.33	2 60
b) Ability to Match no. of Puzzle pieces	E	0 88 NS	2.90 *	1.41 NS	2.79 *
	C	0.86	2.67	0.40	2 54
3. Irregular Shapes (Highly Complex Task)					
a) Ability to Match	E	0.20 NS	1 85 **	0.05 NS	1.40 **
	C	0 16	0.63	0.03	0 36
b) Ability to Match no. of puzzle pieces	E	0 30 NS	1.90 **	0 10 NS	1.70 **
	C	0 30	0.80	0.08	0.57
(1) Basic Shapes		Square Triangle and Circle			
(2) Bilatrally Symmetrical Shapes and Rhombus	:	Oval Star, Rectangle, Pentagon, Circle, Cone			
(3) Irregular Shapes		Highly Complex task (6 Puzzle pieces)			

* Significant at 5% level ** Significant at 1% level NS. Non-Significant

The post-test mean score of the experimental group of the 'A' and 'B' school was found to be higher than that of the Control group, and the test revealed a non-significant result.

In response to matching number of puzzle pieces in the case of both of 'A' and 'B' schools, the Experimental group performed better than the Control Group In the case of pre and post-test mean scores in the above — mentioned schools, the results were non-significant between the groups.

(1) Neutral and Basic Colours	Black, White, Red, Blue and Yellow
(2) Other Colours	Green, Purple, Brown and Chromium

Neutral and Basic Colours

The pre and post-test mean scores of 'A' and 'B' schools were higher in the case of the Experimental group as against the Control group on ability to match colours and ability to match number of puzzle pieces

The analysis showed non-significant findings in both the aspects for pre and post-tests between Control and Experimental groups.

Other Colours

The Experimental group of 'A' and B' schools scored higher in pre and post-test scores than the Control group on ability to match puzzle pieces. The test showed non-significant (pre-test) and significant (post-test) result between the groups.

The pre-test and post-test mean scores of 'A' and 'B' schools were higher in the case of the Experimental group than the Control group on ability to match puzzle pieces. The analysis indicated non-significant (pre-test) and significant (post-test) result between the groups.

Table 4 represents the mean performance scores of children in the Experimental and in the Control groups on identification and naming of colors.

TABLE 4

Performance of Children on Identification and Naming of Colours

Identification and Naming of Colours	*Groups*	*Type of School* *A* *Pre-Test Mean*	 *Post-Test Mean*	 *B* *Pre-Test Mean*	 *Post-Test Mean*
(A) Identification (Simple Task)					
(1) Neutral and Basic Colours	E	0.65 NS	2.00 *	0.30 NS	1.73 **
	C	0.60		0.28	0.67
(2) Other Colours (Highly Comlex Task)	E	0.30 NS	1.97 **	0.28 NS	1.60 **
	C	0.27	0.95	0.26	0.47
(B) Naming					
(1) Neutral and Basic Colours (Simple Task)	E	0.50 NS	1.78 *	0.20 NS	1.60 **
	C	0.48	1.52	0.18	1.03
(2) Other Colours (Highly Complex Task)	E	0.13 NS	1.68 *	0.12 NS	1.30 **
	C	0.10	0.53	0.53	0.30

* Significant at 5% level ** Significant at 1% level NS Non-Significant

Identification of Colours

The pre and post-test mean scores of 'A' and 'B' schools exhibited a higher score in the Experimental group when compared to the Control group with respect to identification of neutral and basic colors. Non-significant (pre-test) and significant (post-test) results were found between the groups.

The Experimental group of 'A' and 'B' schools performed better in pre and post-test score than the Control group with respect to identification of other colours. There exists a highly significant result between the two groups.

Naming of Colours

In the case of both 'A' and 'B' schools, on naming of neutral and basic colors, the Experimental group scored better than the Control group in pre and post-test scores. There was a non-significant result in pre-test and a significant in one post-test between the groups.

The Experimental group of 'A' and 'B' schools performed better in pre and post-tests than the Control group with regard to naming of other colors. The tests indicate non-significant (pre-test) and significant (post-test) results between the groups.

Table 5 presents mean performance of children on identification of sizes (big and from an array of 5 and 10 alternatives)

TABLE 5

Performance of Children on Identification and Big/Small Size

Identification of Big/Small Size	*Groups*	*Type of School* A *Pre-Test Mean*		*Type of School* B *Pre-Test Mean*	
		Pre-Test Mean	*Post-Test Mean*	*Pre-Test Mean*	*Post-Test Mean*
1 From an Array of 5 Alternatives (Very Simple Task)					
(1) Sizes of Same Shape	E	1,65 NS	2 77 NS	1.17 NS	2.60 NS
	C	1 63	2,67	1,08	2.41
(2) Sizes of Different Shape	E	0 78 NS	2.08	0.33 NS	1.60 NS
	C	0.75	1 92	0 30	1.37
2. From an Array of 10 Alternatives (Very Simple Task)					
(1) Sizes of Same Shape	E	0,63 NS	2.75 *	1.15 NS	2 57 **
	C	1,60	2.54	1.07	2.12
(2) Sizes of Different Shape	E	0.76 NS	2.01 *	0.32 NS	1.08 NS
	C	0 73	1 82	0 30	0.54

* Significant at 5% level ** Significant at 1% level NS Non-Significant

Identification (Array of 5 Alternatives)

The Experimental group scored high over the Control group in pre and post-test in both 'A' and 'B' school children with respect to identification of same shape The test indicated non-significant difference between the groups

As regards the pre and post-test mean scores of 'A' and 'B' school children in respect of sizes and different shapes, the Experimental group exhibited a better score compared to Control group, indicating non-significant difference between the groups.

Identification (Array of 10 Alternatives)

In case of 'A' and 'B' schools with respect to same shapes, the Experimental group showed up better in pre and post-test mean scores, as compared to the Control group. The test indicated a non-significant result in pre-test and a significant result in post-test between the groups.

The Experimental group of both 'A' and 'B' types performed better in the case of pre and post-test mean scores against the Control group with respect to different shapes. The test revealed non-significant (pre-test) and a highly significant (post-test) result between the groups

Table 6 presents the performance of children on matching of sizes from an array of 5 and 10 alternatives.

Matching (5 Alternatives)

In case of both 'A' and 'B' schools on matching sizes of shapes and ability to match number of puzzle pieces, the Experimental group performed better in pre and post-test scores,when compared to the Control group. The result was non-significant between the groups.

In case of both 'A' and 'B' schools on size of different shapes (ability to match the number of puzzle pieces) the Experimental group exhibited a better pre and post-test score, as compared to the Control group and revealed a non-significant result between groups.

Matching (10 Alternatives)

The Experimenta' group of both 'A' and 'B' schools scored higher in pre and post-test mean score than the Control group on ability to match puzzle pieces and number of puzzle pieces. The test indicated a non-significant pre-test result and a significant post-test between the two groups.

TABLE 6

Performance of Children on Matching of Sizes

Matching of Sizes	*Groups*	*Type of School* A *Pre-Test Mean*	A *Post-Test Mean*	B *Pre-Test Mean*	B *Post-Test Mean*
1. From an Array of 5 Alternatives (Very Simple Task)					
(i) Sizes of Same Shape (a) Ability to Match	E	1.62 NS	2.98 NS	1.25 NS	2.96 NS
	C	1.58	2.90	1.22	2.85
(b) Ability to Match no. of puzzle pieces	E	9.09 NS	2.76 *	1.34 NS	2.04 NS
	C	2.05	2.67	1.28	1.86
ii) Sizes of Different Shapes (Complex Task) (a) Ability to Match	E	1.68 NS	3.00 NS	1.36 NS	2.80 NS
	C	1.58	2.88	1.27	2.68
(2) Sizes of Different Shape	E	2.11 NS	3.00 NS	1.36 NS	2.60 NS
	C	2.10	2.50	1.33	2.51
2. From an Array of 10 Alternatives					
(i) Sizes of Same Shape (Complex Task) (a) Ability to Match	E	0.68 NS	2.70 *	0.36 NS	2.20 **
	C	0.62	2.44	0.34	1.67
(b) Ability to Match no. of puzzle pieces	E	0.78 NS	2.62 *	0.40 NS	2.20 NS
	C	0.75	2.38	0.38	1.63
ii) Sizes of Dif. Shapes (Complex Task) (a) Ability to Match	E	0.70 NS	2.82 *	0.38 NS	2.38 NS
	C	0.67	2.65	0.35	1.27
(2) Sizes of Different Shape	E	0.80 NS	2.82 NS	0.42 NS	2.30 **
	C	0.77	1.28	0.37	1.30

* Significant at 5% level ** Significant at 1% level NS: Non-Significant

The Experimental group of both 'A' and 'B' schools scored higher in pre and post-test score than the Control group with respect to ability to matching of sizes and number of puzzle pieces. However the results were non-significant in pre-test and significant in post-test results between the groups

Table 7 presents the mean score of children on seriation of sizes

TABLE 7
Performance of Children on Seriation of Sizes

Seriation of Sizes	*Groups*	*Type of School*			
		A		*B*	
		Pre-Test Mean	*Post-Test Mean*	*Pre-Test Mean*	*Post-Test Mean*
1 From an Array of 5 Alternatives (Simple Task)					
(i) Sizes of Same Shape	E	0.19 NS	1.53 *	0.17 NS	1.51 **
	C	0.15	1.31	1.22	1.10
ii) Sizes of Different Shapes	E	0.16 NS	1.84 NS	0.14 NS	1.73 NS
	C	0.13	1.63	0.11	1.36
2. From an Array of 10 Alternatives					
(i) Sizes of Same Shape (Highly Complex Task)	E	0.23 NS	1.67 **	0.08 NS	1.43 **
	C	0.23	0.67	0.07	0.40
ii) Sizes of Different Shape	E	0.30 NS	2.07 **	0.17 NS	1.73 **
	C	0.30	0.83	0.13	0.60

* Significant at 5% level ** Significant at 1% level NS Non-Significant

Seriation of Sizes (5 Alternatives)

The experimental group of both 'A' and 'B' schools scored higher in pre and post-test scores than the Control group with respect to ability to seriate. The test indicated non-significant (pre-test) and significant (post-test) results between the groups

The pre and post-test mean score of both 'A' and 'B' schools was higher in Experimental group than the Control group with respect to seriate number of puzzle pieces matched. The analysis test revealed non-significant pre-test and significant post-test results between the groups.

Seriation of Sizes (10 Alternatives)

The pre and post-test mean scores of 'A' and 'B' schools exhibited a better score in the case of the Experimental group as compared to the Control group with respect to an array of 10 alternatives, and there exists non-significant (pre-test) and a highly significant (post-test) difference between the groups.

In the case of the children of 'A' and 'B' schools, on ability to seriate number of puzzle pieces, the Experimental group was higher than the Control group in pre and post-test. There exists a non-significant result in pre-test and a significant result in post-test between two groups.

Table 8 depicts the pre and post-test mean score of children of Experimental and Control groups on the recitation aspect.

TABLE 8
Performance of Children on Recitation

Recitation	*Groups*	*Type of School* A *Pre-Test Mean*	A *Post-Test Mean*	B *Pre-Test Mean*	B *Post-Test Mean*
1. Alphabets	E	0.65 NS	2.58 NS	0.33 NS	2.58 NS
(Very Simple Task)	C	0.62	2.50	0.30	2.50
2. Numbers	E	0.67 NS	2.83 NS	0.37 NS	2.77 NS
(Very Simple Task)	C	0.67	2.80	0.35	2.75
3. Rhymes	E	0.70 NS	2.78 NS	0.42 NS	2.73 NS
(Very Simple Task)	C	0.68	2.70	0.40	2.75

* Significant at 5% level ** Significant at 1% level NS · Non-Significant

Alphabets

The Experimental groups of both 'A' and 'B' schools have scored better in pre and post-test than the respective Control groups on recitation of alphabets. There exists a non-significant difference between the two groups.

Numbers

The Experimental groups of both 'A' and 'B' schools scored higher in pre and post-test than the respective Control groups on recitation of numbers (1 to 10). The test indicated a non-significant difference between the groups.

Rhymes

The experimental group performed slightly better than the Control group in both 'A' and 'B' schools (pre and post-test) in recitation of rhymes. There exists a non-significant difference between the groups.

Table 9 reveals the mean score of children on sequential thinking

TABLE 9

Performance of Children on Sequential Thinking

Sequential Thinking (According to Rhymes)	Groups	Type of School A Pre-Test Mean	A Post-Test Mean	B Pre-Test Mean	B Post-Test Mean
Sequential Thinking (Highly Complex Task)					
(a) Ability to Sequence the Puzzle Pieces	E	0.50 NS	1.85 **	0.20 NS	0.60 **
	C	0.48	0.66	0.18	0.47
(b) Ability to Sequence the number of Puzzle Pieces	E	0.53 NS	2.30 **	0.30 NS	1.75 **
	C	0.50	1.00	0.30	0.60

* Significant at 5% level ** Significant at 1% level NS : Non-Significant

The Experimental group in both 'A' and 'B' schools scored more in pre and post-test score than the Control group. The test indicated a non-significant result in pre-test and a highly significant result in post-test between the groups.

As regards the performance of children on sequential thinking the Experimental groups in the case of both 'A' and 'B' type of schools showed up better than the Control group in pre and post-test. The analysis indicated non-significant (pre-test) and significant (post-test) results between the groups.

Table 10 states the mean scores of children on the concept of alphabets.

TABLE 10

Performance of Children on Identification and Naming of Alphabets

Identification and Naming of Alphabets	Groups	Type of School A Pre-Test Mean	A Post-Test Mean	B Pre-Test Mean	B Post-Test Mean
1. Alphabets (Highly Complex Task)	E	0.30 NS	2.07 **	0.80 NS	1.73 **
	C	0.29	0.83	0.75	1.60
2 Naming (Highly Complex Task)	E	0.23 NS	1.67 **	—	1.43 **
	C	0.20	0.67	—	0.40

* Significant at 5% level ** Significant at 1% level NS Non-Significant

Identification

In case of both 'A' and 'B' schools on identification of alphabets, the Experimental group scored better than the Control group in pre and post-test. A non-significant result in pre-test and a highly significant in post-test was observed between the groups.

Naming

The performance of the Experimental group was better than the Control group in pre and post-test on naming of alphabets However, a highly significant difference between the Control and Experimental groups was noticed.

Table 11 depicts the mean score of children on mathematical concepts.

TABLE 11

Performance of Children on Mathematical Concept

Mathematical Concept	*Groups*	*Type of School*			
		A		*B*	
		Pre-Test Mean	*Post-Test Mean*	*Pre-Test Mean*	*Post-Test Mean*
Counting (Highly Complex Task)	E	0.28 NS	2.02 **	0.08 NS	1.60 **
	C	0.26	0.71	0.08	1.42

* Significant at 5% level ** Significant at 1% level NS : Non-Significant

The pre and post-test mean score in the case of both of 'A' and 'B' schools exhibited a better score in the Experimental group when compared to the Control group on mathematical concept. There exists a non-significant result in pre-test and a highly significant result in post-test between the groups

Table 12 shows the mean scores of children on creativity.

TABLE 12

Performance of Children on Creativity

Creativity	*Groups*	*Type of School*			
		A		*B*	
		Pre-Test Mean	*Post-Test Mean*	*Pre-Test Mean*	*Post-Test Mean*
1. To Spontaneously Pattern and Verbalize (Highly Complex Task)	E	0.10 NS	2.30 **	—	1.28 **
	C	0.06	0.50	—	0.27
2. To Do New and Different Patterns (Highly Complex Task)	E	0.17 NS	2.48 **	—	1.63 **
	C	0.13	0.75	—	0.37

* Significant at 5% level ** Significant at 1% level NS Non-Significant

TABLE 13

Tasks and Concepts (from Very Simple Highly Complex) of the Test and Performance of 'A' and 'B' type-of-school children between Experimental Group and Control Group in the Post-test

Very Simple Task	*Simple Task*	*Medium Task*	*Complex Task*	*Highly Complex Task*
Consists of 3-5 no. of puzzle pieces 'A' – Non-significant 'B' – Non-significant	Consists of 3-5 no. of puzzle pieces 'A' – Non-significant 'B' – Significant	Consists of 7 no. of puzzle pieces 'A' – Significant 'B' – Significant	Consists of 7-10 no. of puzzle pieces 'A' – Significant 'B' – Highly Significant	Consists of 6-10 no. of puzzle pieces 'A' – Highly Significant 'B' – Highly Significant
I. Matching				
• Matching of basic shapes (3 shapes) – square, triangle and circle	————————>	Matching of bilaterally symmetrical shapes (7 shapes)– oval, star, rectangle, pentagon, circle, cone and rhombus	————————>	Matching of irregular shapes (6 puzzle pieces) – highly complex task due to irregualr shapes
• Matching of neutral and basic colours (5 colours) black, white, red, blue and yellow	————————	————————>	Matching of 10 colours – lemon yellow, white, pink, orange, blue, red, green, purple, brown and chromium yellow	
• Matching of sizes from an array of 5 alternatives – Sizes of same shapes – Sizes of different shapes	————————	————————>	Matching of sizes from an array of 10 alternatives – Sizes of same shapes – Sizes of different shapes	

(contd. ...)

TABLE 13 (contd.)

Tasks and Concepts (from Very Simple Highly Complex) of the Test and Performance of 'A' and 'B' type-of-school children between Experimental Group and Control Group in the Post-test

Very Simple Task	*Simple Task*	*Medium Task*	*Complex Task*	*Highly Complex Task*
Consists of 3-5 no. of puzzle pieces 'A' – Non-significant 'B' – Non-significant	Consists of 3-5 no. of puzzle pieces 'A' – Non-significant 'B' – Significant	Consists of 7 no. of puzzle pieces 'A' – Significant 'B' – Significant	Consists of 7-10 no. of puzzle pieces 'A' – Significant 'B' – Highly Significant	Consists of 6-10 no. of puzzle pieces 'A' – Highly Significant B' – Highly Significant
II. Identification • Identification of big/ small from an array of 5 alternatives – Sizes of same shapes – Sizes of different shapes	→	→	Identification of big/ small from an array of 10 alternatives – Sizes of same shapes – Sizes of different shapes	
	Identification – Basic shapes	→	Identification of bilaterally symmetrical shapes	
	– Neutral and basic colours	→	→	Identification – Other colours
	III. Naming – Basic shapes	→	Naming of bilaterally Symmetrical shapes	
	– Neutral & basic colours	→	→	Naming of other colours

TABLE 13 (contd.)

Tasks and Concepts (from Very Simple Highly Complex) of the Test and Performance of 'A' and 'B' type-of-school children between Experimental Group and Control Group in the Post-test

Very Simple Task	*Simple Task*	*Medium Task*	*Complex Task*	*Highly Complex Task*
Consists of 3-5 no. of puzzle pieces 'A' – Non-significant 'B' – Non-significant	Consists of 3-5 no. of puzzle pieces 'A' – Non-significant 'B' – Significant	Consists of 7 no. of puzzle pieces 'A' – Significant 'B' – Significant	Consists of 7-10 no. of puzzle pieces 'A' – Significant 'B' – Highly Significant	Consists of 6-10 no. of puzzle pieces 'A' – Highly Significant 'B' – Highly Significant
	IV. Seriation of Sizes From an array of five alternatives – Sizes of same shapes – Sizes of different shapes			Seriation of sizes from an array of ten alternatives – Sizes of same shapes – Sizes of different shapes
V. Recitation				
– Alphabets	———	———	———>	Identification and naming of alphabets
– Numbers	———	———	———>	VI. Counting Numbers
– Rhymes	———	———	———>	VII. Sequential Thinking To Pattern the puzzle according to the rhyme
				VII. Creativity **To make different new patterns spontaneously**

In case of the 'A' type schools, with respect to performance of children on creativity, the Experimental group scored much better than the Control group, indicating a non-significant result in the pre-test and a significant result in the post-test.

The pre-test mean score of zero was obtained by both Control and Experimental groups of 'B' type of schools on creativity. However, there exists a highly significant difference between the groups in post-test.

Summary and Conclusion

The ideal method to enhance the quality of pre-school education is through drawing out spontaneously the potentialities of the children through the play-way method. To make this method most effective and fruitful; materials play an important role

The best choice is to opt for low-cost play materials. These puzzles were systematically developed and arranged into a wholesome programme, to stimulate and develop both the Cognitive and the Creative abilities. These were also adapted to rhymes and charts to suit Indian culture

For the study, the pre and post-test design was undertaken to see the effectiveness of the programme. Two groups of children from 'A' and 'B' types of schools were selected with a total of 240 samples. Each group consisted of four schools; two were randomly taken as the Experimental group and the other two as the Control group. Each group consisting of thirty children with 15 boys and 15 girls The Experimental group was exposed to the puzzle programme whereas the Control group was not

Eight tasks like Matching, Identification, Naming, Recitation, Sequential Thinking, Counting and Creativity were tested These tasks and the concepts were identified as very simple to highly complex. The mean performance scores for both Experimental and Control groups, with each task containing different concepts like Shape, Color, Size, Alphabets, Mathematical concept, Language development and Creativity, were tested. The means were analysed using 't' test.

The results reveal that the Experimental group performed significantly better than Control group. As the complexity of the task increased from very simple to highly complex, the Experimental group of both A and B type of schools showed highly significant difference, when compared to the Control group in the post-test.

Thus the present study on the Puzzle Programme has been highly successful and effective on the Experimental group of A and B type of schools in developing and drawing out the Cognitive and Creative faculties and helping the children to grow as wholesome beings.

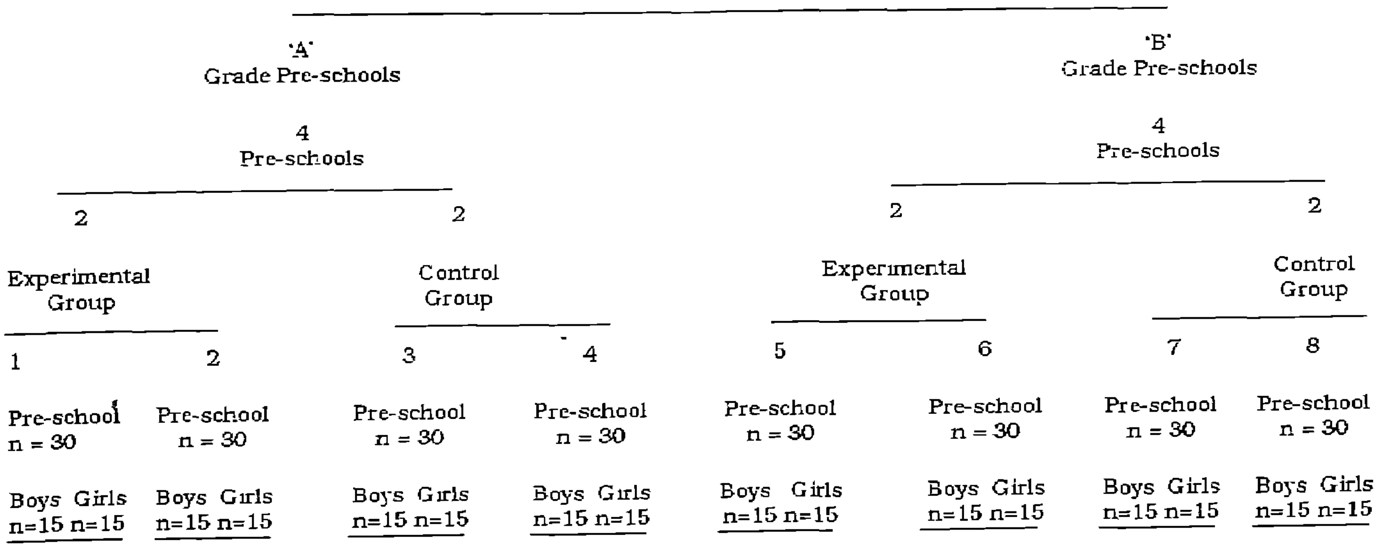
Recommendations

The following recommendations are hereby presented for future use:

- Manufacturing of puzzles can be undertaken by the cottage industries
- Construction of puzzles can be introduced as part of the Socially Useful Productive Work (SUPW) in high schools, so that the same puzzles could be used for pre-primary.
- Puzzles can be used in educating special children; these can also be used in training programmes.
- Study can be done on a bigger sample
- The puzzles can be adopted/adapted to teach other concepts.

SAMPLE SELECTION

List of Pre-Schools Classified into



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15

ACTIVITY BASED CLASSROOM TRANSACTION : A CASE STUDY

Neera Chopra

The study recognised the child's innate ability to understand mathematics. It aimed at eliminating fear of mathematics and enabling the children to explore, discover and feel comfortable with their acquaintance with small numbers. The study argued that it was the teacher who best understood the understanding level of each child. This statement was validated by the findings of the baseline studies conducted at the beginning of Classes I, II and III. The analyses of the results for the past two years showed a tremendous spurt towards improvement. More than 90 per cent students had mastered the required skills and abilities. It was established that learning was now more meaningful, interesting and stress-free.

Introduction

School Mathematics Project

The maths project was introduced at S M.P. (School of Mathematics Project, Delhi University). The basic aim was to evaluate why many children fear mathematics. It was found that the problems lay at the foundation level. A group of Class I to III teachers were involved in this project. A discussion/seminar was held in which teachers from various schools, both government and public, participated and it was found that the children's basic foundation was not laid properly, and also, to a greater extent, the contents in the textbook were responsible for creating confusion in the child's mind. It has been seen that every child has initial mathematical skill in him, but our textbooks do not provide enough activities to build on the child's inborn ability to understand maths.

In the Mathematics Project, teachers and children are the main participants in the development of the activities and games. Teachers and other members participate in informal discussions and, based on these discussions, background papers are prepared and circulated to all the participants Participating teachers design activities and games which are structured during the workshops. These are shared by the teachers from the participating schools. These activities and games are tried out in classrooms, and modified and changed, if necessary. These are discussed in the feedback workshops before they are finalised

The areas that have been covered are : numbers (including zero), shapes and space, patterns number operations (addition, subtraction, multiplication and division), place value, measurement of time, weights, distance (length), estimation, decimals and fractions.

The materials used to develop teaching aids and games are stones or pebbles, bottle caps, used notebook covers and other such recycled materials. Each child has a set of materials to handle and learn with.

The participating schools, both government and public schools, have been following this alternative curriculum and methodology in Classes I, II and III. The baseline survey conducted at the beginning of Class II and Class III and the assessment tests (class tests as well as individual tests - written as well as oral, sometimes using concrete objects) at the end of the three classes have clearly indicated the effectiveness of the programme.

We, at the Naval Public School, introduced some of these activities/games in Classes I, II and III in 1996, and this year in Class IV.

Major Consideration for Taking up the Study

- Fear of maths in childhood.
- Progressive hatred for maths.
- To recognise the child's innate ability and address that instead of proclaiming that "the child is blank".
- Not taking into account "the intuitive knowledge", (the acquisition of knowledge of mathematical facts without recourse to reasoning) when formulating the content and the process of what the child was taught.

- To change the teacher's perception of the child's interpretation
- To recognise the innumerable facets of the child's awareness and internalize them by practice and experience.
- No stress on logic and symbols as they are absent in the early part of child's acquaintance.

Specific Aim

Designing activities and curricular materials which would:

- Begin from children's initial understanding and intuitive knowledge.
- Provide opportunity for oral work and discussion and also introduce mathematical vocabulary like "how many more ..", "...fewer than...", to talk mathematics, to invent word problems themselves.
- Provide opportunity for spontaneous, non-standard symbolic representation (iconic and symbolic) and transit to formal representation system.
- Involve working with their own bodies as a group, with their fingers and also with concrete manipulands
- Bring in contextual problems, everyday experience represented mathematically.
- Correlate situations and problems which invoke mathematicization, and general problem- solving.
- Allow and even encourage alternative ways of conceptualizing number, eg., to think of 13 as not only 10+3 but also as 15-2
- Connect different curricular areas either by thematic integration or direct integration through various activities.

Methodology

Stage 1

A baseline survey was held in 1996 for Class I where each child was tested in maths and English. The objective of this survey was to examine the

- acquisition of basic concepts in the areas of maths and english;
- performance of the child in comparison with the norm;

- specific areas where the child lags behind;
- link between the problem area and the child's performance in the class.

The Baseline Survey proved very effective for the teachers concerned and the parents as well.

Each child's learning capability and problem area were identified and, accordingly, remedial help was provided. It helped the teachers to find new ways and methods to teach concepts to the children.

Test Items

1. Baseline Survey —
    - Sorting
    - Conservation task
    - Concrete and abstract addition
    - Counting.
2. Oral and Written Alphabets —
    - Upper case
    - Lower case
    - Letter/sound association
    - Picture recognition
    - Visual discrimination
    - Basic sight words
    - Reading/comprehension
    - Spelling
    - Addition
    - Subtraction.

Result

TABLE 1

Problem Areas : Maths Concepts

		Baseline Survey				*Others*	
Class/Sec	*Total No of Students*	*Students Appeared*	*Cons*	*Sorting*	*Counting*	*Add*	*Subs*
I-A	38	35	10	—	—	12	13
I-D	30	26	14	3	—	6	12
I-C	38	34	18	—	—	3	5
I-D	38	37	14	—	—	4	7
Total	144	132	56	3	—	25	37

Problem Areas : English Concepts

Class/ Sec	*Total Students*	*Std Appd*	*Oral Writt. Alpha*	*Lett. Sound Assessment*	*Pict. Recog*	*Vis. Dscr.*	*Basic Sgt. Words*	*Reading Comprn*	*Spellings*
I-A	38	35	1	13	—	—	9	9	14
I-D	30	26	1	17	—	2	10	13	19
I-C	38	34	1	23	—	4	5	9	23
I-D	38	37	—	7	—	—	7	3	4
Total	144	132	3	60	—	6	31	34	60

TABLE 2

Problem Areas , Maths Concepts

Class/Sec	*Total No of Students*	*Students Appeared*	*Baseline Survey*			*Others*	
			Cons	*Sorting*	*Counting*	*Add*	*Subs*
I-A	36	36	3	—	—	1	1
I-D	37	35	2	—	—	2	2
I-C	30	30	3	—	—	2	1
I-D	36	32	2	—	—	1	1
Total	139	133	10	—	—	6	5

Problem Areas : English Concepts

Class/ Sec	*Total Students*	*Std. Appd.*	*Oral Writt. Alpha.*	*Lett. Sound Assessment*	*Pict. Recog.*	*Vis. Dscr.*	*Basic Sgt. Words*	*Reading Comprn.*	*Spellings*
I-A	36	36	1	4	—	1	2	3	6
I-D	37	35	—	3	—	1	2	3	4
I-C	30	30ß	1	6	—	3	2	3	5
I-D	36	32	—	3	—	—	1	1	5
Total	139	133	2	16	—	5	7	10	20

Comparison of Problem Areas Found in Maths and English Concepts (Table 1) Taken in January 1996 with the Problem Areas (Table 2) Found in the year 1998.

In the year 1996, our school was exposed to the SMP workshop, and the first year of interaction was filled with lots of activities and games which were introduced, discussed and incorporated in our teaching pattern, but in rather an inconsistent manner. Practical approaches to teaching and developing mathematical skills were also introduced The test conducted was to observe how children grasped these mathematical skills through the given activities but the result was not encouraging.

There was a remarkable improvement in the performance (as seen in (able 2) after successfully completing three years of the activity oriented integrated teaching approach.

- The creativity of the children was seen clearly where addition and subtraction were dealt with in a commendable manner For example, when given a sum like 9 7 2, they could express it both ways :

  9 = 7 + 2 and 9 - 7 = 2

- Tremendous improvement is seen in mental maths as the children work out carry over sums mentally.

  e.g., 18+9 = 27

  by various different ways :

  18 + 10 = 28 - 1 = 27

  20 + 9 = 29 - 2 = 27

  9 + 10 = 19 + 1 = 20 + 7 = 27

- Create their own problem solving sums
- Easily use mathematical vocabulary in their everyday Language.

These will be clearly visible from some of the examples (worksheets of the children attached in the Annexures).

These have been made possible because of :

- *Thematic Approach (Holistic Approach)* followed where all subject areas are correlated so that children can see the relationships between the concepts learnt.
- *Freedom of Thought and Expression* —Where children express their feelings through pictorial depiction, a trial-and-error method is adopted and they discover for themselves how

different things work. This has created a secure environment where mistakes become part of the learning process. This has made learning interesting and stress free.

- *Learning How to Learn* —They have acquired the skills on how to tackle new information and concepts without which learning becomes meaningless and superficial. The different activities related to the skills have led to an all round development of imagination and personality. They can find relationships and draw conclusions on their own.

A free atmosphere in the learning process, therefore, has enabled the children not only to acquire knowledge, but also to understand and apply it practically in different fields, making learning more meaningful, natural, joyful and pleasant.

Stage II

Based on informal discussions, background papers on concepts/ areas were circulated to all the participants. The participating teachers deliberated on these papers and designed activities and games which were structured during the following workshop. These were tried out in classrooms, modified and changed if necessary and discussed in the feedback workshops before they were finalised. This steps may be summed up thus;

Informal discussion → Background paper designing of activities and games →Trial in classrooms →Modification change → Feedback workshop →Finalisation.

This programme has helped children in mathematical conceptualization through playing with ideas rather than manipulating symbols in their note books. The emphasis is on using manipulands while teaching the children. Situations which lend themselves to quantification are identified and such situations are turned into games and activities The areas that have been covered in Classes I to III are :

Numbers (including zero), shapes and space, patterns, number operations (addition and subtraction), place value, multiplication, measurement, time, estimation and money.

The Numeration System

The activities and games are designed help the children in :

- knowing the correspondence between spoken and written numerals (distinction is made between numerals and the numbers they represent):

- knowing that there is an association between a numeral and the cardinal number that it represents, so that seeing or hearing the numeral suggests information about its magnitude instead of looking at a set containing that number of objects,
- knowing the sequence of numerals and also being able to count back and forth from any point in the sequence;
- knowing that exactly the same structure makes it possible to count on or back in tens, hundreds and thousands without learning anything new except a few mathematical names.

Some exemplary activities and games are described below:

The number "2"

- Oral work Students show 2 fingers, and start looking for parts of their bodies. 2 hands, 2 legs, 2 eyes, 2 ears; then start looking around them to find 2 windows, 2 doors, 2 desks, 2 wings and 2 eyes of a butterfly in a picture, etc.
- This is followed by celebration of the number , i.e., celebrating the birthday of the number say "5" — 5 candles placed on a cake; paper caps and balloons grouped in five's; children start counting five's on their fingers and then counting other objects in the classroom in fives.

The number "Zero"

The concept is introduced through role-play — one child acting as zero and others as other numbers. To strengthen the concept further, colouring games, domino cards and pebbles were used. The children found the additions facts of numbers (less than 10) moved on to subtraction facts then to subtraction facts of zero. This was done as oral work with the whole class participating.

Odd and Even Numbers

These are introduced through the Kale Jotta game and by forming pairs with friends. The hundred board chart was used for reinforcement.

Place Value

Use of arrow cards and number charts to make numbers e.g. 243.

1. 200 40 3

→ 243

2	1	2	3	4	5	6	7	8	9
	10	20	30	40	50	60	70	80	90
	100	200	300	400	500	600	700	800	900

These activities and games are only a few of the activities/games used in the particular area

Major Outcomes of the Programme

- As baseline survey is conducted at the beginning of Classes I, II and III, the teacher understands the level of understanding of each child.
- Assessment tests (individual tests, sometimes using concrete objects and written tests) at the end of the respective classes have shown the following :
- Tremendous improvement in the area of mental maths.
- The creativity of the children.
- Slow learners who had withdrawn themselves into a shell, gained a lot of self-confidence as they could not only understand but see relationships.
- Non conventional methods were used by children.
- The written expression of the children improved in language.
- Communication skills have been mastered by the children.
- Understanding of mathematical language and ability to use it in framing of word problems (given the operation) by the students.
- The analysis of the results of two years showed a tremendous improvement. More than 90% of the students had mastered the required skills and abilities
- Learning has become more meaningful, interesting and stress-free.

Implications of Findings for School Effectiveness

This study would help in the following ways:

- It would help in the elimination of fear of mathematics and pupils would develop a happier response to the mathematics classes.

- It would enable the children to discover, explore and become comfortable with their innate acquaintance with small numbers.
- It would introduce certain new areas of mathematics like 'estimation' and 'pattern recognition and formation' which facilitate learning of concepts like measurements, tables (addition and multiplication) and spatial relationships.
- It introduces low cost teaching aids, e.g., pebbles for the concept of odd and even numbers
- It encourages recycling/reusing materials, e.g., notebook covers relate to the child's everyday use objects and environment
- The teacher also enjoys the teaching of the subject as some concepst have been understood by her/him only by adopting this method.
- The thematic approach can be adopted where all subjects are correlated and the single class teacher system can be adopted.
- Mathematical vocabulary is incorporated in the child's everyday language.
- The programme has in built cooperative learning techniques.
- The class teacher system allows a flexible timetable.
- The textbook which is the greatest deterrent to learning is done away with.
- The syllabus is based on what should be the learning outcomes at each stage.
- The syllabus can be adopted by government/rural schools with a simple change in medium of instruction
- Teacher training is inbuilt as teachers are themselves the main components of evolving and implementing the project.

Conclusion

Now into the third school year, the brains behind SMP are toying with the idea of coming out with a set of teaching aids for teachers so that the fruit of their labour of the past three years can be distributed to other schools. Now that we have tried out SMP for a couple of years, there is a need to formalise it so that we can present it to the National Council for Educational Research and Training (NCERT) as an alternative to the existing system which is based on a one-way transfer of knowledge from the teacher to the students.

ANNEXURES

Classroom Feedback Form	Annexure A
Games Planner	Annexure B
Activities Designed and Tested by Teachers of the SMP group	Annexure C
Exemplary Activities - Tried and Tested and Found Very Effective in the Classroom situation	Annexure D

ANNEXURE A

School Mathematics Project

Classroom Feedback Form

Name of the Activity —
School —
Class —
Date —

1 Grouping — Individual, Pairs, Small Groups, Whole Class
2. Time — Short session, Full session, Several sessions
3 Was the activity
enjoyed, rejected, worked with modification
4. How the activity was introduced
5. How the activity was done
Students' Response — (Asking questions/Thinking aloud Mathematical Vocabulary used /Use of number names spontaneously and correctly/Examples of everyday lang. instead of mathematical lang.
— Did you spot any misunderstanding
— Examples of everyday language instead of mathematical language

ANNEXURE A

School Mathematics Project
Classroom Feedback

Note This is a form for recording classroom feedback. It should be used flexibly rather than rigidly.

> Name of Activity

> School

> Date

1. Grouping : Individual/Pairs/Small groups/Whole class
(What worked in practice? Did the activity lend itself to independent work or co-operative work?)

2. Time : short session / full session / several sessions

(Half an hour or so) (about an hour) (how many)

3. How readily was the activity/problem/situation understood? Were any changes made to facilitate this?

4. Could they play the game/carry out the activity

5 Was the activity enjoyed?
rejected?

Does the activity work with modifications?

(What is the new form of the activity?)

6 Write an account of an interesting piece of work done or time spent productively and enjoyed

7. Did children talk to each other by explaining instructions thinking aloud or asking questions?

8. Did they listen to each other?

9. What questions did they ask you?

10. Did you spot any misunderstandings?

11. What mathematical vocabulary was used confidently?

12. Did children use number names spontaneously and correctly, without being prompted? In what context did this happen?

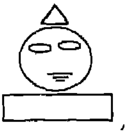
13. Were there any examples of everyday language being used instead of mathematical language?

14. Did you find out anything about a particular child's understanding or knowledge that you didn't know before?

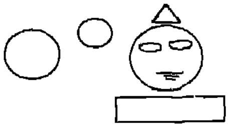
15. Did children enjoy working in this way? What problems did they have? Did they overcome them?

Task 1 Recognition of Shapes / Sorting/Ordering

प्रकार पहचानना, ढूँढना और सही स्थान पर रखना



- * Make the child feel comfortable
- – आओ इन टुकड़ों से एक चेहरा बनाएँ।
- * Use the middle-sized set to make the figure shown
- * Place the small and large discs on the table and display the other pieces.
- – अब इन टुकड़ो से ऐसे ही दो और चेहरे बनाओ



सबसे छोटा चेहरा कौन सा है?

- – सबसे बड़ा चेहरा कौन सा है?

Record responses.

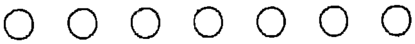
Task 2 Addition in Concrete Mode

जोड़ - ठोस चीजों के साथ

- – ये एक बटन लो। ये एक और बटन लो। अब कितनी हो गयीं?
- – ये दो बटन लो। एक और बटन लो। अब कितनी हो गयीं?
- – ' ये एक बटन लो। दो और बटन लो। अब कितनी हो गयीं?

Task 3 Number Conservation / संरक्षण

- – ये कुछ काउंटर्स हैं।
- * Place the PINK (पिंक) counters at equal distance. Give the BLUE (ब्लू) counters to the child.



- – हर पिंक काउंटर के आगे एक ब्लू काउंटर रखो।
- * Help the child to place the BLUE counters at equal distances, one near each PINK counter.
- – बताओ पिंक काउंटर ज्यादा हैं या ब्लू काउंटर या दोनो बराबर हैं?
- * Space the PINK (पिंक) counters (yourself)
- – अब बताओ पिंक काउंटर ज्यादा हैं या ब्लू काउंटर या दोनों बराबर हैं?
- * Space the BLUE (ब्लू) counters to bring them in correspondence with the PINK (पिंक) counters yourself
- – अब बताओ पिंक काउंटर ज्यादा हैं या ब्लू काउंटर या दोनो बराबर हैं?

Task 4 **Ordinality / क्रमसूचकता**

- * Show the card set with pictures of six objects.
- ये चित्र देखो।
- इसमे पहले चित्र में क्या है?
- तीसरे चित्र में क्या हे?
- पोचवे चित्र मे क्या है?
- चौथे चित्र मे क्या हे?

Record response counting from the left

Task 5 Counting / गिनती

गिनती आती है? सुनाओ।

Record highest number upto 100 that the child can count to correctly.

Task 6

- * Place a small collection of buttons on the table. Take 3 and place them in front of the child
- बता सकते हो ये कितन बटन हैं?
- * Add 2 more buttons.
- अब कितन हो गये?
- * Add 2 more buttons
- अब कितन हो गये?

Record the method the child uses : does not count
counts in ones
counts on, etc

Task 7 **Addition in Context / जोड़-संदर्भ मे**

- तुम्हारे पास यदि एक टॉफी हो और तुम्हे एक और दे दें तो कितनी हो जाएंगी?
- तुम्हारे पास दो टॉफियॉ हो, एक और दे दी जाए तो कितनी हो जाएगी?
- तुम्हारे पास एक टॉफी हो और दो टॉफियाँ और दे दी जाएं तो कितनी हो जाएगी?

Task 8

- हमारे पास कुछ बटन हैं।
- * Place some buttons together on one side of the table.
- इनमे आपस में बाँटते हैं।
- एक तुम लो, एक मैं लेता हूँ।

- एक और लो, अब बताओ किसके पास ज्यादा हैं?
- मैं एक और लेता हूँ, अब किसके पास ज्यादा हैं?

Start with a button with the child and ask the question.

अब किसके पास ज्यादा है

at the stages 2,1 2, 2 4, 3 4, 4

Task 9 Writing Numbers

- तुम्हे गिनती लिखनी आती है?

  दस तक लिख कर दिखाओ।

Task 10 Addition in Abstract Mode / जोड़-अमूर्त

- एक और एक कितने होते हैं?
- दो और एक कितने होते हैं?
- एक और दो कितने होते है?

Task 11 Repeat Task 4 — the test for ordinality.

ANNEXURE B

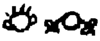
School Mathematics Programme

Centre for Science Education and Communication
University of Delhi

GAMES PLANNER

Initial Conversational >

Activities

1. My family	Conversation
* Places child at ease	
* Sorting	घर पर कौन कौन है?
* Categorizing	सबसे बडा कौन है? सब से छोटा कौन है?
* Comparisons	तुम सबसे बड़े / सबसे छोटे हो? भाई–बहन है?
Language of comparative terms' ordering with big small, smallest, etc	**Not** to ask कितने भाई- बहन हैं? कितने बड़े, कितने छोटे?
Materials : drawing paper colour pencils/ crayons	Ask घर से कैसे आते हो? **Not** to use पास–दूर * children can be asked to draw pictures of themselves and other members of the family — they bring their drawings to teacher who talks to them about their drawings— asks them who is who, and writes मम्मी, पापा etc. next to the pictures as identified by each child.
gum cut-outs	* If cut outs  are there in large numbers, children can be asked to pick as many as they need and stick them in a scrap book
2. Breakfast	> What did you eat for breakfast this morning? / साथ लाए हो? क्या लाए हो? > **Not** to ask, कितनी रोटियाँ etc. **not** to use एक/दो for answers like daliya कितना खाया? and show इतना? ( ) इतना? quantity with gestures. गरम खाते हो या ठंडा? for answers like roti, parantha, talk about their shape, बड़े या छोटे? किसने बनाया?
Materials	* children could make cutouts and stick them. Fractions may emerge and should be allowed to, naturally
papers to stick	
newspaper	* (to whole class:) किस-किसने रोटी खाई?

gum	This information could be represented by asking children to cut papers into shapes , and stick them on a chart.

GAMES

3. Three-in-a-row ("तिकडम") Game 4	No conversation
recognition of 0,00,000	> No questions
* composition of these numbers	> No Number names
* children play in pairs	
* winning strategy	

Materials
tikdam board
8 identical counters
to each child.

4. nim (Game 8)

* played in pair - with 3, 4 or 5 objects	> Teacher shows how to play without using number names, by demonstration
* winning strategy	

5. Ghar chalo (Game 3)

* groups of 2-to-4 * no winning strategy	> while giving instruction, number names are to be avoided
* "reading" icons- associating number sense with them.	"as many leaves/arrows as you get, take as many steps forward/back
* operations	
* mental addition/ substraction	

Materials
ghar-chalo board
ghar-chalo die
1 counter for each child

6. Kalli-Jotta (Game 5)

* in pairs	> teacher defines 'kalli" and 'jotta" — no reference to
* no winning strategy only guessing	odd and even or to "two" जोड़ी बनाओ। क्या कुछ बचता है? हाँ - कल्ली, नहीं - जोट्टा

- Preliminary identification of odd-even
- Composing number

Materials — * verification is important, not the guess itself.
about 40 seeds per pair — > children verify guess by making pairs

7. Memory (Game 6)

- in pairs — four — "क्या ऐसा है ?"
- recognizing/reading icons
- cardinality of 1-3

Materials
memory/snap card set

8 Connections (Game 7)

- in pairs — fours — > not समानता
- open ended. — > instructions by example.
- relational thinking — children encouraged to make connections
- important that there are no correct answers predecided. — > teacher may need to be referee

Materials
connections card set

9. Snap (π=t∑) (Game 9)

- in pairs
- purely mechanical
- no winning strategy
- recognition of icons

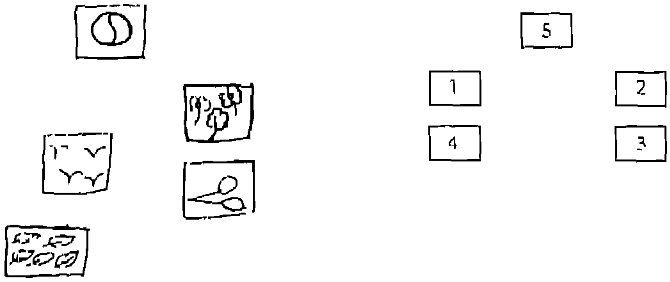
Materials
memory/snap card set

10. How many missing? (Game 10)

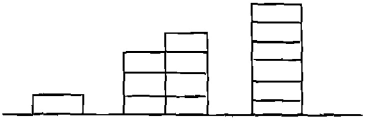
- in pairs — > each child to ask "कितने गायब हैं?"
- number conversation — other child to answer by holding up as many fingers.
- number sense

Materials
about 6 seeds between them.
handkerchief

प्रश्न 1 चित्र कार्ड का अंक कार्ड से मिलान करो –



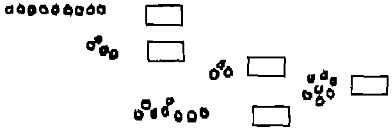
प्रश्न 2 लुप्त सीढ़ी के स्थान पर नई सीढ़ी बनाओ –



प्रश्न 3 : कोष्ठक ( ) में > या < चिह्न लगाओ –

1. 5 ☐ 3
2. 2 ☐ 8
3. 6 ☐ 1
4. 9 ☐ 7
5. 3 ☐ 4
6. 7 ☐ 2

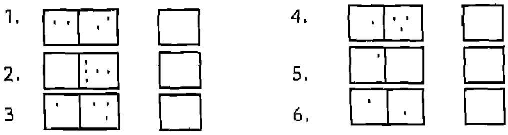
प्रश्न 4 मोतियों को गिनो और ☐ में लिखो। वे कितने हैं :



प्रश्न 5 : नीचे कोष्ठक में दी गई संख्या को ऊपर की पंक्ति में दिए दो कोष्ठक में तोड़कर लिखो .

1	1	5										
	6		6		6		6		6		6	
2	2	6	6	2	4	4	5	3	7	1	2	6
	8		8		8		8		8		8	
3	3	4										
	7		7		7		7		7		7	
4	4	5										
	9		9		9		9		9		9	

प्रश्न 6 : कार्ड पर बने बिन्दुओं को गिनकर ☐ में सही अंक लिखो :



प्रश्न 7 . सवाल हल कीजिए :

1. 2 + 3 = ☐
2. 4 + 5 = ☐
3. 3 + 6 = ☐
4. 1 + 4 = ☐
5. 2 + 6 = ☐

प्रश्न 8 : रिक्त कोष्ठक भरिए .

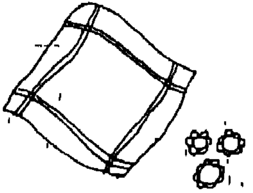
1. 5 – 3 = ☐
2. 7 – 2 = ☐
3. 9 – 6 = ☐
4. 6 – 2 = ☐
5. 4 – 1 = ☐

प्रश्न 9 रिक्त स्थानों में (+, –, =) भरिए :

1. 9 .... 2 7
2. 5 .... 3 8
3. 7 .... 3 4
4. 6 .... 3 9
5. 8 .... 5 3

प्रश्न 10 : रूमाल के नीचे कितने है : कुल ढक्कन = 10

(1)



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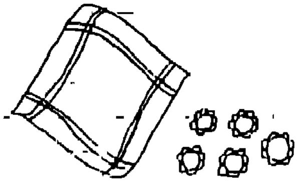

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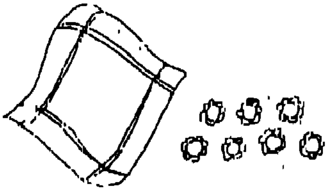

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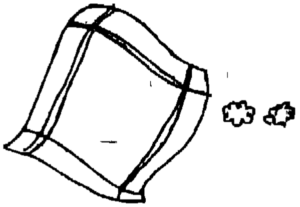

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ANNEXURE C

Activities Designed and Tested by Teachers or the SMP Group Puzzles and Riddles

Class II

— How many letters are there in your first and last names? Are those even or odd numbers? Add them together. Is the sum an even or an odd number? (In Hindi don't count the matras)

— Four boys had a race. Anil was not second or fourth. Vikas was first. In what position did Anil finish the race?

— I am either a cube, a cylinder or a sphere. I have one curved surface and atleast one edge. What am I?

— Three friends are all of different heights. Ankita is the tallest. Vikram is shorter than Rahul. Who is middle height?

— Gautam is selling guavas at 1 rupee each. Manjit is selling mangoes at 5 Rupees each. Gautam has sold 27 guavas. How many mangoes must manjit sell to have more money than Gautam.

— Anita ate half a chappati. She gave half of what remained to her dog. How much of the chappati is left

— 57 29 12 39 43

I am not less than 15. I am not more than 41. The sum of my digits is 12. Which number am I?

— Varun has 5 more marbles than Samir. Together they have 13. How many marbles does Samir have?

— If you subtract 14 from the number I am thinking of you get the same number as 23 + 45. What number am I thinking of?

— The sum of the ages of two friends is 16 years. The difference between their ages is 2. How old are they

Riddles

— I am less than 20 and more than 17. I'm odd. Who am I?

— Some people think I'm unlucky. When my digits are ulta, I become the number of days in October. *Who am I?*

— Magic Squares

4	9	2
3	5	7
8	1	6

A

5		3
	6	
9	2	

B

Akshay drew square A in which he put the number 1 to 9. What is this ? asked Raveena "It's a magic square" he said, 'Add up the numbers in any row, column or along any diagonal - the answer is always the same"

'Big deal" said Raveena. I can make one too". So she drew the square B and filled in some numbers But she left some places blank. Can you help her by filling in the remaining numbers so that it becomes a magic square also.

Blue, Red and Green

Colour each row using all the three colours and at the end write the number of times you have used each colour.

- — An elephant is caught in a jungle of numbers. It can escape only by moving along squares which contain odd numbers He can move up-down left-right or diagonally and can escape from any of the squares at the edge
- — Which is the shortest route of escape?
- — Which is the longest route?

15	13	2	7	6	8
4	6	9	8	5	10
12	12	10	3	12	4
18	14	16		16	2
12	17	13	11	18	14
11	2	1	12	8	10

Multiplication and Division

- — Cards are prepared with sums involving operations on multiplication and division These are arranged on the ground in a circle. At a signal from the teacher, children start moving around the circle and when the teacher says stop they stop - one child to catch card (the number of cards must ofcourse be equal to the number of children) Each child works out the answer to the problem on her card The teacher then calls out a number Those children whose answer is the same as the number called out go out of the game and then cards are taken out of the circle When there is only one child left in the game she is the winner Cards may be prepared like the ones shown below .

— Oral conversations like 1 chair has legs
2 chairs have legs
also chairs have 24 legs
30 fingers hands
28 days weeks
24 months years
100 Rs = 20 Rs

Note Children can be asked how they worked out the answers
Blackboard work can be done simultaneously.
Written record can be maintained

— With oral work, get children to keep records like

— Given 10 bottle caps. Divide into groups of 5.

The number of groups formed =

— Other objects like marbles and ask them to be divided into 2 groups. How many marbles remain?

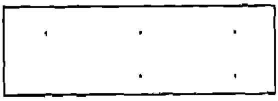
— Introduce the division sign

2 x 3 = 6% = 2
3 x 2 = 6% = 3
8% 2 =
12% 4 =

Note Children should be asked to make word problems based on these statements.

— Multiplication facts using Dot Cards

The teacher displays a card with dots like the one shown below and asks children ' How many dots ?



2 x 3 = 6 as well as 3 x 2 = 6

This is repeated with cards having other patterns. Children should be encouraged to make cards with their own patterns.

ANNEXURE D

Exemplary Activities

Mala Moti I

Objective :	Oral addition and subtraction, with concrete objects also involved
Nature of activity :	Children are given varying numbers of beads and asked to amek a mala of a specified number of beads
Materials required	Beads, string
Nature of participation :	Individual
Description :	Each child is given some beads. The teacher says to the whole class : > Make a mala of 7 beads Then she goes around the class and talks to each child. > You have 4 beads How many more will you need? > You have 10 beads. How many are left over? Return them etc.
Output :	None at initial stage Could have the expressions, such as 4+3=7, recorded if the activity is repeated at a later stage
Extension	This activity can be used to generate a large number of 10 bead mals, which are used as counters along with loose beads to facilitate counting of large numbers and introduce the concept of place value.

Mala

Partitioning of numbers, addition

Nature of activity	Children make necklaces with paper beads
Materials required :	Thread and paper flowers or beads made by the children earlier (in various colours)
Nature of participation :	Small groups

Description

- — The children are asked to make :Mala, using the flowers/beads They have to specify how long the "mala" will be and how many flowers of each kind they want to put in. The flowers can be of various sizes as well The conversations with the teacher involve estimation of the number of beads one would need, ideas of "more" and "less", and even twice as many, half as many and so on
- — Children could record their work by making picture of the necklaces, or ever sticking the necklaces with paper beads

Kalli-Jotta

No. of Players	2
Materials required :	30-40 Rajma seeds
Procedure :	The teacher introduces the terms Kalli (odd) and Jotta (even) by showing the children how to make pairs with the seeds (i.e. Jotta when there is no remainder and Kalloi when there is one remainder left).

Each player picks up a handful of seeds and asks the other to guess whether the number of seeds he has is odd or even. The teacher helps them in pairing seeds and finding out whether there is no remainder or one seed remains over.

This game can be developed at a later stage by taking away three seeds at a time

Bolo Bhai Kitne

Objectives	Familiarisation with numbers (initial level) and exposure to division with remainders
Nature of activity :	Game
Materials required :	None
Nature of participation .	Whole class
Description .	The children stand in a large circle.(They could be slowly moving round in the circle, clapping). The teacher ten calls out

>> Bolo Bhai Kitne?

To which the children reply

>> Aap bolo jitne

The teacher now calls out a number, say, 5. The child now form groups of 5. Children who fail to do so are "out". The process can now be repeated with the teacher calling out a different number.

Output	None
Looping	When done at a later stage, the teacher can draw attention to the number of children left out and the number of groups formed and its relation to the number of children playing. This is an introduction to division, quotient, remainder.

SECTION V

Community Participation and School Effectiveness

The studies discussed in this section include:

- Community Participation and Resource Mobilisation for Educational Development of Minorities
- A Study of the Relationship between Community Participation and School Effectiveness

16

COMMUNITY PARTICIPATION AND RESOURCE MOBILISATION FOR EDUCATIONAL DEVELOPMENT OF MINORITIES

Mohd. Muzammil

The study aimed at defining the relative profile of the educational performance of children of the Muslim and Sikh minorities in relation to their socio-economic status The study concluded that one of the factors of the poor performance of Muslim students was the fact that Waqf proporties of Muslims had not been effectively utilized for the cause of education, while the gurudwara schools had played a better role. The findings of the study suggested providing educational instruction in the Urdu language at the primary stage.

The educational backwardness of the minorities in India, particularly of the Muslims, needs no re-emphasis and in view of their educational deprivation, the need for making school education effective for their children becomes self-evident. Muslims are the largest minority in India but their enrolment at various levels of education is much less than their proportion in the total population (Table 1). The same is the case with regard to their proportion in the prestigious educated jobs in the country (Muzammil, 1994). That this situation obtains even after fifty years of Independence is depressing and disheartening, indeed As compared to other communities in India, Muslims are a late starter for the mass education of their children. Due to several reasons, female literacy is extremely low, which is one of the chief reasons for the persistence of a high rate of illiteracy in the Muslim community. Adult education among minorities is also greatly lacking. The individual and community resourcelessness, *inter alia*, come in the way of education of their children, and their having remained illiterate perpetuates poverty in the next generation (Muzammil, 1990).

This paper presents a case study of district Pilibhit in Uttar Pradesh, India, which lies in the Terai region (foothills of the Himalayas) bordering Nepal

District Pilibhit presents a unique example of the concentration of Muslim and Sikh minorities with their divergent educational performance, given the state-supported educational infrastructure almost equally available to both. Community participation, asset ownership, local resource mobilisation, teacher training and community cooperation and collective commitment seem to have made the entire difference in educational performance.

District Profile

Pilibhit is a small district in Bareilly Division but from the view point of population, it has been one of the four fastest growing districts of Uttar Pradesh (UP) during 1971-81. Muslims account for 21 per cent of the population while the Sikh population is about 4 per cent. The community-wise population of district Pilibhit is given in Table 2 which reveals that the population of minorities accounts for about one-fourth of the total.

Pilibhit borders Nepal in the north, along with parts of Nainital district, Bareilly in the west, Shahjehanpur in the south, and Shajehanpur along with Lakhimpur in the east. It is 262 kms from the State capital Lucknow.

The economy of Pilibhit district is largely agricultural and relatively backward, which has a bearing on the social life of its inhabitants. The district is divided into three Tehsils : Pilibhit (Sadar), Bisalpur and Puranpur; and seven development blocks, viz Amaria, Lalaurikhera, Marauri, Barkhera, Bisalpur, Bilsanda and Puranpur Tehsil Puranpur is an entire Development Block.

TABLE 1
Muslim Enrolment in Educational Institutions

	Category	*No. of States/ Districts Surveyed*	*Percentage of Muslim Population*	*Percentage of Muslim Students*	*Educational Index of Muslims*
1.	Elementary Schools	12 states 45 Districts	17.32	12.39	0.72
2	Secondary Schools	11 States 38 Districts	18 56	10 70	0 58
3	High School	8 Boards	12.00	4.00	0.33
4	Intermediate (Pre-Univ.)	5 Boards	10.30	2 49	0.24

Source : Report on Minorities Ministry of Home Affairs, Government of India, New Delhi, 1983.

TABLE 2

Minorities' Population in District Pilibhit

	Minority/ Majority Group	*Total Population (Number)*	*Rural*	*Urban*	*As Per cent of the District's Population*
1.	Hindus	753940 (100.0)	655227 (86.9)	98713 (13.1)	74.77
2.	Muslims	212938 (100.0)	150115 (70.5)	62823 (29.5)	21.12
3	Sikhs	39329 (100.0)	37732 (96.0)	1591 (4.0)	3.90
4	Christians	1255 (100.0)	997 (79.4)	258 (20.6)	0.12
5.	Others	856 (100.0)	649 (75.8)	207 (24.2)	0.09

Source Government of Uttar Pradesh, State Planning Institute Sankhakiya Patrika (Statistical Bulletin) - District Pilibhit, Lucknow 1993.

While Amaria and Bisalpur are Muslim majority blocks, the concentration of the Sikh population is mainly found in Puranpur Block.

Data and Methodology

This study is based on primary data collected from five villages each in the Amaria, Bisalpur and Puranpur blocks. In Amaria and Bisalpur, the total population covered is about 17 thousand, from 2,352 households. The composition of population in the selected area shows that it has 80.6 per cent Muslim population, 12.8 per cent Scheduled Caste population and 6.6 per cent other cases. The average family size is of 6.9 members (per household) in Amaria and 7.3 in Bisalpur.

For the Sikh majority areas, five villages were selected from Puranpur Block and samples were also taken from the Puranpur town area The present survey includes 117 households with a break up of 97 from villages and 20 from the urban area. It covers a total population of 579. The average family size in Sikh majority areas is found to be 5.95

The investigation, *inter alia*, emphasises occupational structure, economic status and asset ownership, community's commitment and resource mobilisation at the local level for educational development It endeavours to find out the links between various economic and social variables of the minority communities and the effective schooling of their children. A comparative analysis has also been attempted as between Muslims and Sikhs

Results and Discussion

The study finds that the low profile of jobs and poor land ownership have been a drag on the effective education of Muslim children: on the other hand, a stronger rural base, ownership of large land holdings and greater community commitment have resulted in better performance of the children of Sikhs in Pilibhit District.

Illiteracy and educational backwardness of all types are found to be more pervasive among Muslims than among Sikhs. Community assets and charity institutions have also played divergent roles in promotion of schooling between the two communities.

There is no denying that the occupational structure of any community plays a determining role in the effective schooling of its children. The agricultural occupation is found to be more prevalent among Sikhs in Pilibhit than among Muslims. About 25 per cent Sikh housedholds are engaged in well established agriculture. This ratio works out to only 9.4 per cent for Muslims. On the other hand, 8.7 per cent of Muslims are working as non-agricultural labourers This category of workers is found to be nil among Sikhs The impact of these distinguishing occupational features is amply evident in the education of the children of the two communities in the rural areas.

Children from well to do rural families are found to be better enrolled and more regular in school. The opposite is true with regard to the labour-class families.

While 16.88 per cent Muslims are engaged in working in industry, only 2.76 per cent of Sikhs are reported to be working in industry People busy in domestic work constitute 33 42 per cent among the Muslims and 29.88 per cent among Sikhs. Of the 1822 working Muslims surveyed, only 4 are found to be in government service while among the 579 Sikhs surveyed, only 6 are reported to be in government employment. Though these are very low figures for both the communities, it is desperately low for Muslims (0.22 per cent of the total working Muslims). Non-attendance and dropping out are found to be more prevalent among those students whose parents are engaged in low-profile jobs.

A distinguishing feature between the Muslim and the Sikh communities is that among Muslims only 15 per cent persons are reported to be students, while among Sikhs, 28 per cent persons are enrolled as students This indicates relatively higher enrolment ratio among Sikhs at all levels.

Poverty of parents perpetuates illiteracy, and it is found to be more prevalent among the Muslims. The survey reveals that 45 per cent Muslim households are below the poverty line (earning less than Rs. 11,000 per annum). The percentage of population below the poverty line among Sikhs is only 20. The number of households in the middle-income group (Rs. 11,000 to Rs 20,000) among Muslims works out to 46 per cent. The corresponding figure for Sikhs stands at 25 per cent. Only 9 per cent of the Muslim households are in the high-income group (above Rs. 20,000) whereas 55 per cent Sikh households come under this category (Table 3).

Statistical analysis of the survey data reveals that there are strong linkages between poverty and non-performance of students at various levels of education. This is found to be particularly valid among low and middle class Muslim households. They are, therefore, found to be the most vulnerable group from the view point of children's schooling.

In rural areas, land ownership provides a cushion for the schooling of children. In district Piliphit, agriculture is more a business of the Sikh community than of the Muslims. In the district as a whole, 96 per cent of the Sikh population lives in rural areas whereas only 70 5 per cent Muslim population lives in villages. Muslims in rural areas are found to be very poor and educationally most backward. Of the total Muslim population covered in the survey, 67.2 per cent are found to be landless, while among Sikhs, only 13 7 per cent are landless. A very large number of Sikh families are big farmers (owning more than 5 acres of land per household. Table 4 would reveal that 46.2 per cent of the Sikh families are big farmers. The proportion of Muslim households under this category is only 2.4 per cent This shows that landlessness and poverty are most common among Muslims as against the landed prosperity of the Sikh community.

A strong correlation is found to exist between land ownership and effective schooling of children This seems, therefore, to be the most important reason why the children of the Sikh community have shown better educational performance. On the other hand, Muslim children are found to be lagging far behind.

TABLE 3

Division of Minority Households in Various Income Groups (per cent)

	Income Brackets	*Muslim Households*	*Sikh Households*
1.	Less than Rs 11,000	45	20
2.	Rs 11,000 - Rs. 20,000	46	25
3.	Above Rs. 20,000	9	55
	Total	100	100

Source. Based on present study.

TABLE 4

Status of Land Ownership of Minority Communities (per cent of households)

	Category of Farmers	*Muslims*	*Sikhs*
1.	Landless	67.2	13.7
2.	Marginal Farmers (less than 2 5 acres)	23.6	16 2
3.	Small Farmers (2.5 acres to 5 acres)	6 8	23.9
4.	Big Farmers (above 5 acres)	2.4	46 2

Source Based on present study

This study reveals that the high economic status of the Sikh community (in terms of land ownership and income and job profiles) has ensured relatively more effective schooling for their children at all levels of education.

Illiteracy is still found to be dominant in the Muslim community The analysis of the data reveals that 52.47 per cent Muslims are illiterate while only 32.81 per cent Sikhs come under this category. About 23 per cent Muslims are found with primary education while the corresponding figure for Sikhs is 30 per cent. Similarly, people with high school qualification are only 2.14 per cent among Muslims and 10.19 per cent among Sikhs.

Table 5 reveals the comparative performance of the Muslim and Sikh communities at all stages of the educational ladder. Muslims are found relatively backward at all levels

TABLE 5

,Cooperative Educational Performance of Minorities

	Educational Category	*Muslims (%)*	*Sikhs (%)*
1.	Illiterate	52.47	32.81
2.	With Primary education	23.16	29.71
3	Middle education	7.67	13.47
4	High School	2.14	10.19
5	Intermediate	0.66	2.76
6	Graduation and above	0.38	3.28
7.	Professional courses	0.11	0.53
8.	Children below 5 years	13.45	7.25
	Total	100.0	100.0

Source: Based on present study data

Regarding out-of-school children, the study finds that among Sikhs, the number of children (5-17 years) not going to school is 6.32 per cent but among Muslims, as many as 57 per cent children do not go to school As far the reasons are concerned, it is discovered that among the non-attenders of Sikhs, 9 per cent owe it to economic resourcelessness but among those of Muslims, 45 per cent do not go to school due to poverty of parents.

Landlessness and poverty are also the main reasons for children dropping out from schools. Several schemes for the promotion of education and effective schooling of the minorities have failed to produce the desired results primarily because of the poverty, and secondly because of the lack of community commitment.

It has been observed that administrative and managerial participation of the minority community (Muslims) in education is lacking. Muslims some how sustain religious education on a community basis but their participation in financing general education is not forthcoming. It is not because of their poverty only. it is also owing to the lack of awareness, optimism and progressive attitudes which themselves are functions of education. In this connection the distinction between Muslims and Sikhs is very clearly marked. For the Sikh community, religious and community institutions are integrated with general education.

Among Muslims, however, another distinction is note worthy. In the Muslim dominated Amaria and Bisalpur blocks, it has been found that there are a type of Female Teacher Home Schools (FTHS) in which an educated female member of the house provides religious education to other girls of the locality (often on a purely charity basis). The FTHS system appears to have great potential, if it receives adequate community or government support.

Government schools (run by the Basic Shiksha Parishad of U.P.) are available at the village level but parents have shown an expressed preference for private schools. But owing to private schools being expensive, the larger dependence is still on government schools In urban areas, while Sikhs send 78 per cent of their children to private schools, Muslims send only 17 per cent of their wards to private schools. The latter accept the qualitative difference, but they are unable to support expensive education in private schools

Women's literacy plays a crucial role in the educational uplift of the children of any community; their role becomes much more important in looking after the education of children at home and providing the necessary psychological advantage to them. But about three-fourths of Muslim women in district Pilibhit are found to be illiterate Several social, economic and historical reasons are responsible for it. Among Sikhs, 41 per cent women are illiterate Further, women with primary education account for 11 per cent among Muslims and 33 per cent among Sikhs Higher education is almost nil among Muslim women, while 4 4 per cent of Sikh women are graduates

Religious community assets are also utilised for educational purposes and play a significant role in this regard (Engineer, 1985). However, community-wise divergent experience is available from this study in Pilibhit. While the Waqf properties of Muslims have not been effectively utilised for social purposes, particularly for education, gurudwara schools have shown a remarkable performance in this regard. Teachers in these schools are relatively better trained and better paid, and the schools are run under the community's efficient supervision and management.

Islamic Madarsas are significant in number and are mostly attached to mosques. They provide religious education in the Urdu medium (apart from reading of the Quran in the original Arabic) Muslims prefer to send their wards to these madarsas as Urdu is not available as a subject/medium of instruction in government schools In view of the Muslim concentration in many areas in Pilibhit district (to the extent of more than 80 per cent of the population), it would not only be good educational policy but also good politics to provide Urdu-medium schools in these areas.

Enquiries have revealed that among Muslims community commitment for the educational advancement of their children is desperately low. This is one of the important reasons why community resource mobilisation is lacking for effective schooling and the advancement of education among the Muslims. This commitment needs to be created and strengthened for the educational uplift of the community.

Policy Implications

Some very important conclusions and policy implications emerge from this study. A detailed blueprint of action will be available as the final Report gets ready.

Ensuring Urdu-medium education in Muslim-majority areas can create miracles. This may be done in several ways: appointing one Urdu teacher in each government primary school in the concerned area and gradually ensuring total instruction in the virnacular At the secondary level of education, Urdu as a subject is capable of producing the same effect. The attachment of Muslims with Urdu is enormous and it can be capitalised for the effective general schooling of their children.

Waqf properties, particularly mosques, maktabs and khanquahs are mostly meeting the religious requirements of Muslims. Mosques are limited to being used as prayer houses and maktabs and madarsas are imparting religious education only. Formal/functional education needs to be integrated with these institutions. This can ensure to a great extent effective schooling of the children of minorities. This type of integration has been very successful in Bangladesh (UNESCO, 1991). It will widen up the social use of Waqf properties for the cause of education.

Governmentally managed schools may be transferred to local bodies/ village level committees for management and supervision. These are sure to be run more efficiently if the community preferences are incorporated in the syllabus. Enlisting the local community's participation in primary education management will produce several advantages. A successful experience of this type has been observed in Chile in Latin America where transferring of governmentally managed schools to local bodies has improved efficiency very remarkably (Peterson, 1997)

Schools attached to gurudwaras are effective Muslim community assets also need to be converted into community halls and school buildings Unused Waqf properties can thus be productively utilised and saved from unwanted encroachments of various types. This will also ensure the individual's and the community's contribution to education in several forms. (a) supplementing the government's effort, (b) encouraging non-government organisations to participate, and (c) taking active part in the management and supervision of education in general.

It has been observed from the present field survey that the minorities capacity to use available educational services is also very weak. That needs to be strengthened to enable them to use the existing facilities Increasing asset ownership and improving their economic status can produce the desired results

Enhanced community commitment and participation at various levels and using religious charitable institutions for educational purposes can go a long way in effective provision of education to the children of the minorities.

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17

A STUDY OF THE RELATIONSHIP BETWEEN COMMUNITY PARTICIPATION AND SCHOOL EFFECTIVENESS

K. Ganeswara Rao

The objective of the study was to find out the school-community relationship and community participation in the overall development of the schools. The study revealed that community participation was higher in urban schools than in rural schools. It was also observed that a positive relationship existed between community participation and school effectiveness. A significant positive relationship was found between community participation and school enrolment. The results provide a strong case for optimising community participation in rural-area schools in order to make the system more effective and functional.

In their innumerable speeches and writings, Raja Ram Mohan Roy, Swami Vivekananda, Lala Lajpat Rai, Mahatma Gandhi, Sri Aurobindo, Jawaharlal Nehru and several others strongly advocated the use of education as the most important single instrument and medium for bringing about progressive changes in our society. Thus school, especially the primary school, was bestowed the responsibility of transforming the poor, illiterate, traditional, ignorant, rural society into a modern, progressive, responsible society

Even after fifty years of Independence we could not achieve the constitutional target of universal primary education for all children between 6 to 14 years of age Thus the primary school could not fulfill its responsibility

Realizing that the poor, ill-equipped school with unattractive surroundings cannot fulfil the target unless it is sufficiently strengthened in all aspects, many schemes like O.B.B. strengthened the infrastructural facilities of the school, while training programmes like S.O.P T. improved the potentialities of the teachers But it was found that the school was still not achieving its target.

In this situation the present trend is that the community should participate in the administration and development of the school. This has taken shape in the form of Village Education Committees in Andhra Pradesh.

Thus, till today we have anticipated that the school will transform the society, and now we are anticipating that the same society will transform the school. This paradoxical dichotomy leads to a natural question 'Who should be given powers to take decisions about the school, the H.M. and his team of teachers or the V.E.C., and in what areas?'

There is an administrative implication in this. To take the correct decision about the role of the V E.Cs., we must have a proper understanding of the prevailing school-community relationships, the functioning of the V.E.Cs and school effectiveness The present paper is an attempt to understand the school-community relationships and school effectiveness of the primary schools in Bhimavaram Mandal in the West Godavari District of Andhra Pradesh.

The Objectives of the Study

- To find out the areas of functioning of the school in which there is community participation.
- To find out the origins of the community participation in the development of the school
- To find out the relationship between the community participation and teacher motivation.
- To find out the relationship between the community participation and students's achievement.
- To find out the relationship between the community participation and school enrolment.
- To find out the differences between rural and urban societies in respect of community participation.
- To find out the areas of school functioning in which

the community participation is being invited by the headmaster.

Theoretical Framework

Since there is a striking difference between the rural community and the urban community, community participation in the school organization can be broadly divided into two categories: (1) Urban Community Participation, and (2) Rural Community Participation.

Community participation in the functioning of the primary school can be in five aspects of school organization. These are. (i) Compensatory work, (ii) Development of infrastructure, (iii) School functions, celebrations and special occasions, (iv) Administration of the school including planning and implementation, (v) Supervision of the school.

School effectiveness can also be divided into effectiveness in five broad areas, namely: (i) Discipline, (ii) Students' achievement, (iii) Teacher motivation or instruction in the school, (iv) Interpersonal relations, (v) Participation in co-curricular and extra curricular activities.

With the help of this theoretical frame work an attempt was made to study the relationship between community participation and school effectiveness.

The Hypothesis of the Study

For the sake of statistical analysis the following null hypotheses were formulated·

1. There is no significant relationship between community participation and school effectiveness.
2. There is no significant relationship between different areas of community participation and different aspects of school effectiveness.
3. There is no significant difference between rural and urban schools w.r.t. community participation
4. There is no significant difference between rural and urban schools in respect of school effectiveness.
5. There is no significant difference between schools headed by male teachers and those headed by female teachers in respect of community participation

6. There is no significant relationship between community participation and school enrolment

Methodology

Tools

To study the community participation in the functioning of the school and its relationship with school effectiveness, two inventories were developed, one to measure community participation and the other to measure school effectiveness

The community participation inventory consists of five dimensions, namely: (i) Compensatory work, (ii) Development of infrastructure, (iii) School functions Celebrations and special occasions, (iv) Administration , (v) Supervision of the school. The inventory consists of 40 items.

The school effectiveness inventory consists of five dimensions, namely· (i) Discipline, (ii) Students' achievement, (iii) Instruction in the school, (iv) Interpersonal relations, (v) Co-curricular and extra-curricular activities. This inventory consists of the 48 items

Apart from these two inventories, personal interviews were also conducted with the headmasters, teachers and M.E.O.

Sample

Complete enumeration was adopted. Data was collected from all the 66 rural schools and all the 37 urban schools of Bhimavaram Mandal. All these schools are government recognised. All rural schools are Mandal Praja Parishad elementary schools and all the urban schools are Municipal elementary schools except two, which are private aided.

Collection of data

Data in the form of inventories was collected from the headmasters of the 103 schools. Data was also collected through interviews with headmasters, teachers and M E.O. Students' achievement was collected from school records.

Statistical Analysis

The collected data was codified and product moment coefficients of correlation were calculated to find out the relationships between the variables and 't' tests were used to find out the significance of difference between the different categories

Conclusions

After performing suitable statistical analysis to test the hypothesis, the following conclusions were drawn:

1. A significant positive relationship was observed between community participation and school effectiveness.
2. Significant positive relationships were observed between all areas of community participation and all aspects of school effectiveness.
3. A significant difference was observed between rural and urban schools in respect of community participation and in all areas of community participation.
4. A significant difference was observed between rural and urban schools in respect of school effectiveness.
5. It is also observed that there is a significant difference between schools headed by male and female teachers in respect of community participation
6. A significant relationship was observed between school enrolment and community participation.
7. In almost all schools the community participation is a function of the headmasters initiative.
8. Almost all the Village Education Committees are for name's sake only and are not functioning properly.
9. None of the headmasters is willing to accept community participation in supervision of the school

Educational Implications

In the present study it was observed that there is a significant positive relationship between community participation and school effectiveness Also it was observed that there is a striking impact on school enrolment where community participation is high. From these two observations we can conclude that community participation should be encouraged to realize universalization of primary education.

Since it is found that most of the community participation is because of teacher initiation, workshops for primary teachers' should be organised to enhance community participation in schools

Since it was observed that the Village Education Committees were not functioning properly, the community leaders should be given appropriate training so that they can organise themselves in promoting the effectiveness of their schools.

Suggestions

Further research should be taken up the find out different formal modes of community participation for the formalization of community participation in schools.

A study of the value systems of the school and community around is also suggested for a proper understanding of the school-community relationship.

SECTION VI

School Climate and Effectiveness

The studies discussed in this section include,

- School Climate and Effectiveness in Contexts of Stringency
- Role of the NGO in UEE — A Case Study of Agragamme
- Teacher-Freezing: A Threat to School Effectiveness
- A Tool for the Ongoing Participatory Road Mapping of the Organization Development of Educational Institutions

18

SCHOOL CLIMATE AND EFFECTIVENESS IN CONTEXTS OF STRINGENCY

Lynn Davies

The author in his study highlighted two significant features of effective schools, namely, 'Flexibility' and 'Democracy'. Both the terms signified increased participation of children in decision-making and other school-related activities The study also helped in highlighting the characteristic of effective primary school system.

Introduction

"We returned the next day for the start of lessons. the coordinator of discipline (a child) rang the bell and announced 'time to work' . The children in charge of personal hygiene checked the hands, fingernails, ears and hair of their classmates They entered the classrooms and each gathered his or her materials, then they were greeted by the teacher. They exchanged information, asked questions, laughed, received pats on the head or shoulder, then they sat down to work, each one on a chosen assignment. They got up freely to consult with peers or with the teacher. Some went to the mathematics learning corner and counted sticks, others went to the science corner to identify different stones, another went to the library and a dictionary and others went outside to look for materials to complement their lesson. One girl interviewed us about the city and recorded our answers in her notebook. She then began work on mathematics, trying to measure with a yardstick. *Her concentration was broken when we asked to test children of their and fifth grade.* On returning to work she seemed confused, she got up and went to the teacher, who explained the marks on the yard stick and gave her a new

> sheet of paper . they talked about how the yardstick could be read and what it could be used for and they read the Teachers' Guide together. He was a teacher-facilitator" (Rodriguez, 1994:17. My italics).

The above quotation about a primary school in Colombia encapsulates my views both about what is an effective primary school and about what is dubious effectiveness research. My paper develops some of the key findings from our recent book *School Management and Effectiveness in Developing Countries* (Harbar and Davies, 1997) There we challenged much of the effectiveness literature as deriving from a somewhat suspect base First was a lack of a properly theorised concept of school ineffectiveness, and secondly, the equation of school success with academic results did not provide a relevant contemporary vision for the international goals of education. In looking at school ineffectiveness, our macro analyses examined why schools continued to demonstrated features of inefficient bureaucracies, and we linked this to the needs of the fragile state for a mass education system which was in fact not too successful (see also Davies, 1994b). Schools in many developing countries operate between the apparent rationality of western or colonial systems and the local discourses of family, religion, tribe and patriarchy Key actors in the education system select those scripts that are in their interests and inefficiency, inequality and bureaucracy and certainly in the interests of some of them. Over-emphasis in policy and research on competitive, selective achievement plays into the hands of these interests

Thus we developed the notion of the 'post-bureaucratic school'. We explored those schools or systems which had broadened out the goals of education — and definitions of effectiveness — to include the essential features of life-long learning, multiple literacies, co-operation, peace, citizenship and a sense of personal control (as well as conventional achievement) The examples were sadly few; but we found these islands of 'effectiveness' characterised by two significant features flexibility and democracy. In this paper I want to describe those features as they pertain to primary schooling, and particularly in contexts of stringency. My argument is that it does not necessarily cost any more to run schools flexibly and democratically, and in fact it is far more cost-effective. It is possible to focus on school climate without massive inputs on materials, buildings and extra or highly qualified staff. But I would also underline the conclusions of our — and many others' research —

that school processes cannot be changed in isolation from deciding what or whom schools are for. There has to be consistency between school goals and school climates. A goal of active citizenship is incompatible with an authoritarian school which tries not to surface conflict Goals of equity and life-long learning are incompatible with schools that select or label children on a narrow range of conventional achievement.

Our conclusions come from a range of developing countries in Asia, Africa and Latin America. This paper will also mention in detail three as yet unpublished studies which underline the importance of school climate, in Brazil, in a study of 'low failure' primary schools; in Uganda, in a study of AIDs education; and in Pakistan, in a study of democratic education through the arts curriculum. Together these studies reveal key climate factors of respect for the student, human rights, and learning in an atmosphere of experimentation, not fear

Flexibility

It has become a truism that we have little idea what the next century will demand and what the learning needs will be. Technology and the global environment bring unforseeable consequences. This is not to argue that there should be no planned curriculum, but that the process of learning should have at least equal place to the content of knowledge. In spite of the technology which makes 'going to school' something of an anachronism, it is likely that collecting young people together for some of their learning will continue for some decades yet, in that schooling fulfills important functions for national and social control. But the effective schools are those which have recognised the economic as well as social imperatives for flexibility in how that collective learning is organised. I will mention four areas.

(a) Time and place

Learning from initiatives in the non-formal sector, it has been found that non-attendance has been tackled by recasting the problem· children are no longer 'dropping out', teachers are 'dropping in'. In China, for example, there have been efforts to bring education to the learner at times and places appropriate to them; morning classes, midday study classes, every-other-day classes pasture coaching classes break-time coaching in planting areas for peasants children and teaching stations for fishermen's children (Chen Shao-Min, 1989) Elsewhere the problem of attendance of girls who have domestic duties - even at a young age - has been tackled by providing day care for younger siblings, or establishing pre-schools next to primary schools (Lockheed and Verspoor, 1991). In the Philippines, there are mobile tent schools, with collapsible tents and furniture so that teachers can follow nomadic groups In the well-known Project IMPACT in S.E Asia, learners were free to stop their studies at any time and come back without being considered a drop-out, 'satellite' learning posts were set up for their convenience, in community or office buildings, or private houses (Ranaweera, 1989) It is not so much the technicalities in different countries and projects as the philosophy which is important here, that schools are designed for the children, not for the teachers or the government.

(b) Materials

Weaving in and out of school , of course, requires a more creative approach than chalk-and-talk at rigid times. Successful schemes are those which use a variety of self-instructional or guided materials. Children - and teachers - can pick these up and work their way through them at a rate which is suitable, This has been part of the success of the Colombia Escuela Nueva programme for rural primary schools, The reform programme was based on the idea of flexible promotion, so that children worked at their own rate alongside others at a similar stage, not necessarily age. Research has also underlined the importance of teachers' involvement in preparing flexible or self-instructional materials (Rodriguez, 1994). If nothing else, teachers should be prepared openly to learn alongside the children, as in the opening quotation

(c) A Range of 'Teachers'

Teachers' salaries are always the largest proportion of an education budget. Yet the research on effective schools in contexts of stringency shows that children can and do learn from a variety of 'teachers', - not always the official ones. One of the most flexible and democratic is, of course, peer-group teaching. I always quote Hugh Hawes here in talking about child-to-child initiatives in areas such as health education:

> ". it makes plain that children can become teachers of their community — of parents, neighbours and siblings — and that they learn and teach in many and varied settings. That schools can admit that they are not the sole repositories of knowledge and can welcome outsiders' who are not primarily qualified as 'teachers', is itself a major step towards the realisation of life-long education" (Hawes, 1988;x)

Analysts such as Hawes recognize the threatening nature of shifting from teacher-centered teaching to peer-teaching, and that rhetorics of 'student active learning' do not happen Teachers think that the only alternative with large classes is to stand and shout at them rather than use group work. Yet the power of the group, once harnessed, also helps in alleviating the potential boredom of self-instructional materials, as Commings (1986) noted in the Philippines and Indonesian contexts.

Rotating group leaders were appointed, all students took their turn at tutoring others in difficulty, children corrected and recorded their own work — thus saving teacher-time as well

A fascinating example of another 'teacher' is to be found in Lockheed and Verspoor's international survey of primary education. In the Dominican republic, radio learning centres were used in communities without schools. Children listened every afternoon under the supervision of an adult from the community.

Achievement tests demonstrate that the children in the radio groups learn as much language and more mathematics than children attending traditional schools in comparable communities. Furthermore, these radio schools cost about half what traditional schools cost (Lockheed and Verspoor 1991·160).

This is an astonishing admission, tucked away in a small section on 'non-traditional schooling'. Why do governments not then turn all primary schools over to radio-type schools? Research on why the children are learning better is crucial. My hypothesis would be that it would be a mixture of the quality of the transmissions and an atmosphere where learners are taking responsibility. The adult is there to supervise, not to instruct; the relationship is not one of expert versus unschooled, but all learning together. Should not this be the model for all schools?

(d) Pedagogy and Assessment

Flexible teachers and teaching, of course, require equally flexible forms of assessment. In the book I quoted the Indian example from Pune, where pupils' self-evaluation during group work was a key feature. The project evolved an innovative device of cumulative evaluation by organising a children's fair (Bal Jatra) every six months, using various activities and games "Since there is no fear of failure or repeating a class and since each child can show good skills in some activity or other, examination stress is absent" (Ranaweera, 1989· 38).

Hawes again, in talking of 'needs now' in applying learning, contrasts, for instance,

> "the educational worth of a child who can readily answer a multiple choice test of child development but ignores her baby sister, with another who has developed a real desire to play creatively with a younger child and has the skills to do so" (1988:83).

One key-flexibility in assessment would also be the 'need-to-know' principle, only testing when a learner requires it. The recent Brazilian study (Damiani, 1998) distinguished 'low failure' from 'high failure' primary schools, and found that the former used far fewer tests than the latter. The less successful schools used constant testing, seemingly as a form of class control. Namibia, in contrast, has introduced criterion-referencing under the principle that students are rewarded for positive "achievement - what they know, understand and can do - rather than being penalised for an accumulation of errors" (Namibia, 1993).

Democracy

Definitions of democracy are many, and will clearly vary according to culture. Furthermore, democracy can be seen as an abstract concept; a good idea in theory, but problematic to operationalise in everyday organisational life. However, I have argued (Davies, 1994, 1995) that it is possible to identify performance indicators of democracy in schools and classrooms, and to find agreement on these across a range of countries. In this short paper, I will just take three areas of policy in schools which we have found demonstrative of democratic practice, and which are linked to the effectiveness of those schools. These are the principles enshrined in the International Convention on the Rights of the Child: participation in decision-making; being treated with dignity; and collaborative learning.

(a) Participation in Decision-making

The ICRC contains the significant statement that children have the right "to participate in decisions that affect them". It is difficult to think of an area of school life that does not affect the children, but effective schools are those which have realistically attempted to involve children in the decision-making as much as possible, without this involving an infinite series of debates, consultations, voting or referenda about every single event. The most obvious form of school democracy is the student council, a growing phenomenon in many countries. In our book we quote from an Indian example, the

Rajasthan 'night schools for 6-14 years-olds who work all day as shepherds and labourers. Not only is this a good example of the flexibility suggested in the previous section, but also of democracy. each school has an elected student parliament, which has the power to help govern the school, fire teachers who are not up to scratch, and push for village improvement. In what to an outsider seems a traditional or patriarchal society, parents, teachers and local officials have relinquished much power to students, many of them girls. The parliament is designed to teach children that democracy should be above gender, caste and creed. In 1996, it was reported (Hughes, 1996) that the project had spread to nine other States of India, so this will now be a familiar practice

I am currently running a research project on student councils and pupil exclusions, which is examining how processes of school democracy can help to certain children in school. The primary schools in the project are definitely in 'contexts of stringency' by UK standards, situated in the poorest inner-city or deprived areas, sometimes with ethnic or group tensions. What seems to be happening is that having a council gives children a voice and a sense of control over their lives. They are aware of formal channels to take their ideas to, and that there are political ways to solve problems. For example, in one school, the combination of the council and various peer mediation schemes have made an impact on the community, in that children are going home to families that normally know only one way to solve a dispute -confrontation or violence - and showing them that there are alternative means to resolve tension. In another school, the council — which has representatives from age 5 to age 11 —has not only achieved material improvement of the school, but acts as a body which monitors other children's behaviour, both in terms of sanctions and rewards.

The success of councils and peer mediation schemes in different countries lies in giving children self-esteem and self-control. The elected representatives obviously feel a sense of importance, but other children too know that adults are seeking their opinions, and will take them seriously A successful council (as opposed to a rhetorical one) looks at curriculum and policy, not just resources, with teachers giving full weight to the children's views In one primary school I know, children are involved in the appointment of teachers and even the headteacher the applicants have to join their Circle Time, have to answer questions put by a panel of children, who then make their recommendations to the appointments committee of the governors. The head said they have never been wrong yet about a new teacher.

(b) Respect for Learners

A linked aspect of democracy is that enshrined in the notion of equal value of citizens, with the right to dignity. In Namibia, there has been recognition of this in their programme of democratic reform of schooling. One of the first acts was the banning of corporal punishment, moving towards a focus on 'learner-centred learning'. This has the notion of mutual respect and cooperation, and that all teachers and learners are both learners and teachers (Namibia, 1993). The reason why so much more ethnographic research is needed in many countries is that teachers do not always operationalise the rhetoric of mutual respect: they expect respect from children while not being prepared to return it. They castigate children for being late, for being 'rude', or for not doing their tasks, while themselves arriving late at lessons, shouting at children and not marking their work. A key principle of democracy is that there is only one set of rules.

A study of potential democracy in Pakistan schools has found this principle infringed in many ways (Quraishi, forthcoming). As part of the ethnography, the study compares four middle schools, with the sample including mixed and single-sex schools. Interestingly, the most authoritarian was one of the girls' schools, which was also the only one still using corporal punishment. The head's concept of 'democracy' was to turn out 'obedient citizens' In the elite boys' school, significantly, the head's concept of 'democracy' was to turn out 'future leaders'. There was a student parliament, but this was about 'declamations and debates', not about making decisions about school life. In both schools, teachers claimed to have interactive and questioning classrooms, yet observation showed that while the teachers did indeed throw out questions, pupils rarely did. Pupil questions were seen as challenging the authority and expertise of the teacher. In the other two schools, there were, however, pockets of more democratic practice, with children freer to ask for help or to make decisions about their learning. It can be hypothesised that a climate where children learn without fear and learn to generate questions will be more likely to encourage effective and life-long learning.

I mentioned earlier the need to have theories of school ineffectiveness. It seems so self-evident that if you want to encourage children to come to school, to enjoy school, not to drop out, and to take control of their learning, then you must generate a climate without fear and where children value themselves. In a study of access to rural schools in Iran, Mehran found nonetheless that:

> "Inappropriate behaviour of the teacher remains a bitter reality in rural and nomadic schools. Physical punishment, psychological degradation, imposition of too many restrictions, excessive discipline and creating an atmosphere of fear and anxiety especially by younger, inexperienced teachers, is a problem for both boys and girls. Parents, however, reported that their daughters 'begin to hate school and their teacher' immediately upon encountering any of the above" (1997:271).

Why do teachers continue to humiliate and brutalise children, to operate double standards, behave in ineffective ways? The theories to explain this relate to socialisation, to power, to psychology, to individualism. I have no time to develop these here, but make the simple point: telling new or qualified teachers that they should be 'effective' or humane will have little impact. Teachers need to experience for themselves the risks and benefits of 'equal-value' climates before they will relinquish outdated ideas about child-rearing and rigid 'discipline'

A particular facet of respect for learners is one where I do concur with most of the effectiveness literature: the importance of 'high expectations' of children. This relates both to behaviour and to cognitive achievement. In my research on pupil democracy, a common thread is heads and teachers saying how they have been surprised at the capabilities of children. A head of a junior and infant school, while believing in school councils for the juniors, did not think the infants (age 5-7) would be ready to be representatives. She was wrong They had their elections, they presented their concerns to their representatives, who were able to articulate those to the meetings. The head had to admit that they could both understand the principles of representative democracy, and behave in a responsible way.

Similarly, in terms of achievement, the valuation of learners emerges in terms of respect for their potential. In the Brazilian study, while the teaching methods were, surprisingly, quite similar and quite-traditional what characterised the low-failure school was the view that children were capable of success. The high-failure school pathologized this community and saw the function of the school as just to provide a homely place to come — as children from this background could not be expected to learn The teachers in the low-failure school, interestingly, did not perceive the community as so poor, and assumed the children could cope. Teachers introduced more new material, instead of just repeating exercises and tests on the old material. One distinguishing feature was that in the low-failure school, in the introduction of any new material, teachers used more pupil participation, establishing what children already knew and asking for their opinions.

A final aspect of respect for learners would be the environment in which learning is to take place. It is significant that when student councils are first set up, the first things they always seem to talk about is the state of the toilets. Badly kept facilities give the message that children are not worthy of anything better. Another distinguishing feature between the Brazilian schools was the poor state of the conservation of the buildings and equipment in the high-failure school Teachers were not bothered, and were more concerned with discipline. However, the low failure school, on similar resources, showed a better state of repair. Teachers realised that the surroundings were important to the children. In my own ethnographies of schools in Africa, I have often been curious about the differences between schools which seem to have an almost fatalistic long-term acceptance of smashed windows and broken door locks, and those which manage to fix them — even if they have to do it themselves. If teaching is about anything, it is about the art of the possible, conveying to children that they can take control of their lives and environment — beginning with the smallest things.

(c) Collaborative Learning

If teachers do not respect children, children will find it more difficult to respect each other A good indicator of a democratic learning setting is mutual value between children A recently completed study of AIDS education in Uganda (Mirembe, 1998) found that simply giving young people information about AIDS was not enough to change their attitudes and concepts of safe sex. Nor did a moralising approach, stressing abstinence. In a patriarchal society such as Uganda, females may be less valued, and males assume that they have the right to demand sex, preferably unprotected Even in the primary schools, girls were the subject of sexual harassment as well as verbal harassment from the boys — as well as sexism from the teachers The mixed schools were very male-dominated, both by male staff and by the boys in positions of power. Mirembe's interventionist research used single-sex as well as mixed-sex discussion groups to give the girls a voice and to enable taboo subjects to be raised Students drew up the rules of the discussion, which included listening and not 'putting each other down'. She was able to start to give the girls a greater sense of self-esteem and given both sexes the ideas that there were alternatives. Girls could refuse risky relationships, boys did not have to adopt traditional notions of masculinity

While Mirembe was successful in the classes she taught, and with some of the teachers in the schools, the children's collaborative behaviour did not always transfer to other more authoritarian or competitive settings. Clearly, there should ideally be a whole-school approach or preferably a whole-system approach. Returning to the Colombian Escuela Nueva programme, this is probably the best example of the need to combine quality with quantity. There is top-level commitment to depart from conventional teaching and learning practice. In that the school curriculum is designed to promote reflective, autonomous learning as well as civic attitudes, inservice teacher training is provided which is based on the conviction that, if teachers are to develop the classrooms in which children's learning is active, discovery-oriented, co-operative and creative, then the processes of teacher training must have the same characteristics. Similarly. school committees where children learn decision-making are linked to local community groups. (Colbert, Chiappe and Arboleda, 1993). In one evaluation of twelve case-study schools, it was found that in almost all the schools there had been an improved relationship and accessibility between teachers and students. Significantly, teachers were prepared to be challenged by students (Rojas, 1994:63). Moreover, other evaluations have found that New Schools students have higher achievement scores than their counterparts in conventional rural schools, as well as significant achievements in terms of self-esteem, creativity and civic behaviour (Torres, 1992: 515)

Conclusion

The key to effective primary schooling in contexts of stringency is the activity which joins flexibility and democracy together. that of learning to make choices. Providing a flexible system enables children (and their parents) to make reasoned choices about when and where to learn, and to feel a sense of control over this. Providing at the same time a democratic system enables children to learn the skills of making choices about power, about how their interests are represented and about alternatives in behaviour Flexible, democratic schools are not anarchic places without rules or curriculum. They are in fact, highly rule-bound. The difference is that the children participate equally in deciding the rules and procedures, and in deciding how they should be implemented. Flexible, democratic schools are not places which sacrifice achievement to some notion of happiness. They have been demonstrated, in fact, to have higher conventional achievement as well as greater pupil self-esteem and ability to learn away from the teacher. The quotation with which I started this paper found the effectiveness researcher measuring the wrong things: she interrupted real learning to 'test' them for standard individualised skills. Assessing truly effective primary schools needs a very different style of effectiveness research with very different indicators.

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19

ROLE OF THE NGO IN UEE — A CASE STUDY OF AGRAGAMME

P.K. Das; V.K. Sunwani

The study examined the role of an NGO named Agragamee in developing an innovative model of primary education for the tribals of Orissa. For this a case study of Agragamee was conducted, involving interview, observation and other indirect methods. It was suggested that with a little modification, this model could be adopted in other areas.

Introduction

Outline of the Study

The major issues relating to the country's commitment to the Universalisation of Elementary Education (UEE) are.

1. Quality Education Programme for all children from all communities in different geographical and socio-cultural set-ups.
2. Designing educational intervention for increasing efficiency levels of educational institutions and achievement levels of learners.
3. Strengthening necessary infrastructural resource and technical support systems.
4. Micro-level planning of educational programmes with full cognisance of the enormous diversity with regard to availability of human and material resources and learner needs in specific communities and areas.

For the successful implementation of elementary programmes of education, non-formal education, and adult education, people's participation is of the utmost importance Further, this involvement should be at the grass-root level, which will therefore bring about participation of voluntary organisations (NGO) and social activist groups on a much larger scale. Thus, there are many NGOs working in the development of specific programmes in education at various levels. There is also a need to know the mechanism of a successful NGO in the field of UEE for the benefit of the government and of other NGOs.

Selection of NGO

Given this background an attempt has been made in this paper to bring out the salient features of the activities in the area of UEE by Agragamee which is reported as being a successful NGO in the field of UEE, particularly NFE and Teacher Training in NFE. The selection of Agragamee gains further significance because of its activities in the backward tribal area of Rayagada in Orissa.

Agragamee

Agragamee came up as part of SWRC in Tilonia, Rajasthan, and commenced operations in Kashipur, Rayagada, in 1981, after having made a survey of the backward and tribal areas of Orissa. The founders were driven with the idea and zeal that something has to be done for the tribals at all levels, be it in education and/or social by Originally, the plan was to take up the project only for a period of six years. But what started in 1981 still continues. Agragamee has its field centres in different districts of Orissa, such as Kandhmal, Mayurbhanj, Koraput, Nawarangpur and Kalahandi. All of them are tribal dominated, with a low literacy level.

Having realised the inadequacy of the formal system of education, Agragamee ventured to offer an innovative system of education aimed directly at the tribal youth in the age-group of 6-14 years to bring them in the overall purview of UEE. Non-Formal Education is essential both as complimentary and alternative to the formal system of education. Agragamee is doing precisely this in order to establish a direct link between education and manpower development.

Objectives

This paper aims at finding out the role of Agragamee in

- Developing an innovative model of education for tribal areas;
- Demystifying the concept of schooling by removing barriers

and imparting education in a free atmosphere for the students and the teachers,

- Linking the childrens education to the community as a whole so that the school becomes a learning forum for the whole village with collective ownership;
- Formation of a set of teaching aids in conformity with the tribal resources and educational contents and attitudes,
- Instilling a spirit of scientific inquiry vis-a-vis tribal attitudes, rituals, customs and traditions.

Methodology

The steps described below were followed to meet the objectives as outlined.

Establishing Rapport

We had a long correspondence with the Agragamee personnel at Kashipur, informing them of our objectives and seeking their help and co-operation. Their response was prompt, which made us go further into the matter, for which we prepared a questionnaire and mailed it to them The answer provided a baseline for the study, along with the replies, they supplied us the latest material they had developed and informed us of their ongoing activities.

Preparation

After collecting all the print and non-print material from Agragamee by post and from their local office at Bhubaneswar, we went through it and made a detailed analysis to arrive at some of the features of organisation. An inventory of reference points was made; a schedule was developed for interviewing the Agragamee personnel as well as the participants and resource persons of the training course..The emphasis was on its education programmes and teacher training courses.

Field Visit

We visited Agragamee Headquarters and some of its field centres and sub-centres After each observation session, we had a thorough discussion pertaining to education in general and in the particular context of the operational tribal areas of Agragamee The discussion and analysis of the various themes gave us valuable insights into the working of this organisation as well as throwing plenty of light on what can be done to make education meaningful and an agent of social change'

Findings

Retarding Factors

1. Schools do exist in the tribal areas, but they become non-functional because the teacher is a rare commodity, hardly to be seen in the village much less in the classroom, since most of the teachers come from coastal belt of Orissa, and every now and then they visit their native place.
2. Further, the teachers do not identify with the community, which is obviously tribal and speaks a language alien to them.
3. The curriculum is alien to the tribal children, this is compounded by the fact that the tribal children use a dialect whereas what is emphasised in the books, and by the teacher in the classroom is the Oriya language. This further distances the student, the community and the classroom.
4. The school calendar does not match the seasons and festivals in the tribal areas, creating a mismatch between days of work or study and festivals.
5. Most tribal children contribute to the survival of their families by managing cattle, collecting firewood, doing household work and other such chores Daytime is the best period for these activities, which is also the time for school, having to choose, if at all, between the two, the house certainly appears more important than the school.

Agragamee, therefore, felt that in spite of all efforts and will of the government, education has been making a slow progress, if at all, in these areas for the reasons listed above.

Innovations by Agragamee

In order to overcome these adverse factors and the constraints of a tribal family and society, Agragamee decided to try out an alternative system of education which would be relevant to the tribal child, making him/her a useful citizen of the society

The system of education suggested by Agragamee therefore offers;

- An integrated approach, a multi-pronged intervention including watershed management, Mahila Mandal Village Committees, Co-operative Societies with NFE oriented towards application of science and technology for rural and tribal development.

- Community participation and interaction in the field of sharing and learning, creating awareness of the historical and ethnic identity of the tribal society, developing self-expression of the students through income-generation activities and integration of these in their day-to-day life for their survival, well-being and education.
- A strong Village Education Committee looks after the selection of teachers, construction of school buildings, management of school funds and organisation of mobile science exhibition, bal melas, athletic meets and formation of childrens' assembly and parliament.
- Guidance and help in establishing Gramin Banks, School Funds, Mahila Funds and Children Funds.

Keeping in view the above Agragamee has tried to make education successful in its centres by

- Selecting teachers from the same locality for better rapport and communication between teacher and student. This also does away with the problem of language.
- The curriculum for the children is so formulated that it is relevant to the tribal situation Rigidity in terms of timing and course content has been done away with, though the teachers are encouraged to refer to the formal school syllabus. Besides, additional material relating to tribal life is provided. Feedback from the teacher ensures appropriateness of the material, as also about its acceptance by the students and the teachers.
- Community participation is encouraged by the villagers to identify the person who can be appointed as a teacher in their NFE centres. Parents and village elders visit the school and share their experiences. The community also helps in constructing school buildings and takes pride in a sense of collective ownership and partnership in the educational process.
- These centres come alive in the evenings when the children return home after their daily chores; thus the timings are in line with the priorities of the community. These schools in

Agragamee parlance are known as night schools and are currently operational in more than 77 villages. The teachers are referred to as Guru Bhai, i.e., Teacher Brother. Holidays are scheduled to suit the work periods in the area. Of special mention is the Education Complex for tribal girls run by Agragamee with support from the Ministry of Welfare, Government of India About 50 tribal girls study in this residential school.

- To make education joyful, Agragamee encourages its teachers to use tribal folk songs, dance and mime, besides story-telling and the modern media to help children learn faster, thus keeping alive the tribal folk traditions
- Agragamee organises co-curricular activities for the tribal children in its centres. These may be bal melas and exposure trips, mobile science exhibitions and childrens' parliament. Some of these activities are linked to income generation, strengthening classroom learning with practical experience and fostering a team spirit among the children.
- Teaching-learning material prepared by Agragamee is produced locally. Number sets, alphabet charts, clay models, leaves and flowers of different colours prepared by the staff facilitate learning by the tribal children, who in turn are encouraged to identify and narrate the use of plants and herbs available in their locality.
- Primers are written in the Oriya script but the language used is the local dialect 'Deshiya'. The use of 'Deshiya' removes the first barrier to learning the Oriya alphabet and creates interest among the tribal children to pursue the study. It help the learners to make a gradual transition from learning through Deshiya to learning through Oriya.

Observations

1. By adopting innovative and flexible approaches, Agragamee has been able to develop the confidence of the society it caters to, so that the people and the society have a sense of collective ownership of the night schools, health centres and other ventures. Agragamee has therefore gone in for the community ownership mode of planning in the domain of school education, particularly elementary education.

2 Community participation in Agragamee NFE centres and night schools is remarkable. A senior member from the village sits for the full duration of the school, from 6 p.m. to 9 p.m., to observe the teaching-learning activities. This is intended as a kind of compliment by the village observer — keeping a vigilant eye on the Guru Bhai and the Students.

3. The education received by the children in these centres is good — comparable, if not better than the formal education in other schools. Looking to the future, Agragamee has planned that the students from its night schools gain admission to schools in the formal system. It has succeeded as some of its students have been admitted to schools in the mainstream of education.

4. Its income-generating programmes have contributed to the finances of the household, and to the general improvement of the socio-economic environment. Since this has been effected through literacy, education is seen as an economically productive endeavour which could also take care of home economics, leading to a fall in the rate of drop-outs

Implications

On the basis of the findings of, and observations made in this study it is suggested that.

- In order to successful by address the malady of the community, particularly that of a backward or tribal area, through education, it should be considered mandatory to recruit teachers from that locality, preferably from that community, so as to make NFE sustainable.
- NFE can be successful if education comes from within, not from outside. This can be possible by adopting people's participatory approach as illustrated by Agragamee.
- **Integration of economy-generating programmes with education makes NFE centres viable as illustrated by Agragamee. The functioning of granary bank, co-operative goatery and duckery, etc., under the monitoring of the education facilitator (Gurubhai) promotes education as a life-survival skill for the deprived and the have-nots.**
- **Spatial integration of the environment with education, such**

as watershed management, wetland management, dryland farming, etc., shall make education more meaningful.

- In order to overcome the difficulty of language in a tribal area, which very often acts as the first barrier to learning, it is imperative initiate the learning through their dialect This necessitates developing primers written in local dialects and drawing examples from local social customs and festivals as illustrated in 'Aamar Bahi' (Our Book) developed by Agragamee This helps the tribals to an easy learning of the alphabets of a language and gradually to learning that language through their dialect.
- The government alone cannot achieve UEE. Selected NGOs like Agragamee can be taken into confidence to act as mutually supportive organs of the government to achieve and accelerate the process of Universalisation of Elementary Education

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20

TEACHER-FREEZING : A THREAT TO SCHOOL EFFECTIVENESS

Haseen Taj

The study aimed at studying the effect of teacher-freezing on the academic performance of students and to investigate the impact of teacher-freezing on teacher effectiveness in elementary school teachers, in addition to a few background variables. The results showed a significant negative relationship between teacher-freezing and teacher effectiveness and also between teacher-freezing and academic performance of students. Some of the background variables of students and teachers were found to have a significant effect on the perception level of teacher-freezing and school effectiveness. A few remedial measures were recommended by the author to reduce teacher-freezing and to enhance school effectiveness.

Introduction

Whether the schools approve or not, they are in one phase of the greatest technological revolution in education that man has yet experienced. The teacher of today able to operate successfully in these changed circumstances will have to be a person of many talents. He must learn to be a scholar, he must learn to communicate, he must understand counselling and have a positive personality, he must know how to use the new materials and he must be acquainted with the new methods. Above all, he must be able to coordinate a variety of talents and resources and focus them on his teaching-learning process.

Truly, it has been said that the quality of a nation depends upon the quality of its schools. The tone and character of life in a country is conditioned largely by the tone and quality of its schools, which depends primarily upon the quality of teachers. The Mudaliar report has stated that the teacher is the most important factor in the contemplated educational reconstruction. The teacher is considered to be the most vital single factor in the system of education, the backbone of society, a superior guide and the nation builder.

But the problem with the present day teachers is that they are falling short of the expectations of parents, the community and the students community. They are not keeping up to the adjectives added to the teacher's stature and profession Different sections of the society are lamenting the indifference and apathy of teachers as the cause for the deteriorating educational standards, the ill-equipped and ineffective students and non-worthy citizens of a country.

Dr. Pires has rightly and beautifully remarked, "if nation's teachers are C_3, the nation itself cannot but be C_3. And let there be no doubt about this; if one wishes to be an A_1, nation, our teachers will have to be A_1 "

The Concept of Teacher-Freezing

The term 'freezing' is defined variedly. According to the 20th Century Chambers Dictionary, it means 'to be very cold', 'to become motionless', to stop at' and 'to prevent the use of'. It also means 'to terrorize' according to the advanced 20th Century Chambers Dictionary. In the present study the first meaning of the term freeze, i.e., 'to stop at' or ' to prevent the use of' is used to refer to the teacher's routine and mechanical performance of their duty.

Most of the teachers are not making use of their potentialities to enhance the effectiveness of teaching and learning as well as the school. They are stagnated in thinking and action (the term stagnated/stagnation is used to mean stuck in the routine and mechanical job of teachers without change or progress). The teachers are stagnated not only in intellectual and psychological (thinking) but also in social, physical and moral (action) aspects.

'Teacher-freezing' is defined as "the unused, underused and stagnated intellectual, psychological, social, physical and moral potentialities of a teacher".

The term 'teacher-freezing' should not be mistaken for teacher lethargy, teacher apathy or teacher indifference. All these terms in one way or the other are used to refer to the teacher's lack of interest, lack of enthusiasm and inability to innovate or cope up with the changes. These terms are narrower, in the sense that they emphasize more the teacher's intellectual aspect whereas the term 'teacher-freezing' is broader and includes not only the teacher's intellectual but also psychological, social, moral and physical aspects; The teachers are not utilizing their potentialities (mechanically doing the job without change) to enhance the quality of the students and the school. Sometimes the teachers use their potentialities to a small extent in one or more of the aspects (mentioned above), which is referred to as 'underused'.

Teacher-freezing refers to the overall indifference/ apathy of teachers not only in teaching/research but also in their social participation, moral development, responsibility and active participation in various within and outside the classroom activities. Hence, the researcher has identified five types of freezing in teachers. These are: (1) intellectual freezing, (2), psychological freezing, (3) social freezing, (4) physical freezing, and (5) moral freezing.

Dimensions of Teacher-Freezing

The dimensions of teacher-freezing are an outcome/outgrowth of the definition given for the term. The following were identified as the major dimensions of teacher freezing:

1. Intellectual dimension
2. Psychological dimension
3. Social Dimension
4. Physical dimension
5. Moral dimension.

1. Intellectual Dimension

Teacher-freezing in this dimension is reflected in the teachers' inability and lack of interest and enthusiasm in utilizing new methods/procedures of teaching and learning, lack of research and experimentation, lack of innovative evaluative methods and procedures, lack of use of audio-visual aids, lack of demonstration, use of outdated materials, lack of individualised instruction, lack of special coaching to exceptional children, lack of scientific and technological know-how, lack of information and knowledge, etc. Teachers are not using or little using their potentialities for intellectual growth.

2. Psychological Dimension

This is one of the important dimensions which reflects teacher-freezing Psychologically freezed teachers show lack of confidence, lack of security, anxiety, fear of failure, lack of interest in research and other activities of the school, lack of attitude towards professional growth and professional ethics, lack of attitude towards innovation, resistance to change, lack of interest in acquiring new knowledge and information, rigid attitude towards students and non-riskly attitudes.

3 Social Dimension

The teachers who are freezed in this dimension avoid social participation, lack human relations, lack interaction with colleagues, parents and community, discourage students' participation in classroom and other activities, lack participation in parent-teacher associations, lack open discussion of problems with head, colleagues, parents and students, lack communication skill and lack accessibility to students and colleagues

4. Physical Dimension

Freezing in the physical dimension refers to the lack of actual/ physical participation and presence in school decision-making, faculty meetings, lack of sharing of school administration responsibilities, lack of involvement in organising school co-curricular and sports activities, more absenteeism, lack of participation in seminars, conferences and workshops, non-membership in professional organisations, not checking students' attendance and records, non-evaluation of students' tests and other achievement-oriented activities, non-observation of students work in groups, delegation of important responsibilities such as teaching and evaluation to students and junior colleagues, not checking up the classroom and school physical facilities, not taking the risk of getting things done, etc

5. Moral Dimension

This is one of the important dimensions of teacher-freezing, which is forgotten by many researchers. It is not only the intellectual or physical freezing that affects the quality of students and the school; moral freezing is one of the deadly aspects that will have very negative effect on the character and attitude of students Teachers who are morally freezed exhibit lack of responsibility towards development of moral judgment among students, lack of responsibility towards character formation and inculcating right attitudes, indifference towards disciplinary measures, non-attention towards classroom discipline and students' behaviour within the school, etc.

These are the major dimensions of teacher-freezing. A teacher need not necessarily be freezed in all the dimensions mentioned A teacher might have freezed in one of the dimensions, for example, some teachers lack interest in teaching/research and experimentation (intellectual) but they may be very resourceful and may participate in other activities of the school (social and physical) and vice-versa. So a teacher can freeze in one or more of the dimensions depending on the situation and the psycho-social factors.

Rationale for the Study

Ultimately, all changes in education, in instruction or in improvement of learning take place in the classroom and are carried out by teachers The teacher then is the crucial person in the situation, the base on which all programmes are built If teachers and school systems over the country improve their programmes and if a trend develops towards better methods, surely obsolescence shall overtake the hindmost Teachers should know that regardless of the outcomes they will have to contribute to the total knowledge and experience of the staff But the present-day quality of teaching and research attitude among teachers are far from satisfactory. Educators, administrators, parents and the community lament the deteriorating standards of education. The students community complains of their shortfall in the skills needed to meet the demands of a new scientific and technologically oriented society. This deteriorating standard in education is due to teachers' apathy, indifference and lethargy This lethargy is not only in teaching and in the intellectual aspect, but also in other aspects such as psychological, social, physical and moral, it goes a long way in making a teacher ineffective as well as creating a negative learning environment and producing low-quality products The teachers are not making use of their potential to produce effective and efficient citizens through innovative classroom instruction/research. The teachers are not using their potentialities to the maximum. To refer to "unused, underused and stagnated" potentialities of teachers, the term teacher-freezing is used.

Just as layers of snow cover big mountains, valleys, and houses and the rays of the sun melt the snow and uncover the beautiful objects hidden underneath, in the same way the freezed potentialities (hidden and not used) of the teachers will have to be uncovered through proper measures. So far no attention has been paid to identify the teacher's overall freezing, which will spell disaster for the country's progress.

Effect of Teacher-Freezing on School Effectiveness

It is very difficult to conceive of a school without effectiveness. Academicians, parents, community, and school managements unanimously agree on the importance of school effectiveness. At the same time there is little agreement among these different groups as to what the concept really means. The principle reason for the notable lack of consensus on the concept stems from the parochial views that many scientists harbour about the effectiveness construct. For instance, school managements usually equate effectiveness with the rate of return on investment. The number of 'pass' or 'fail' (academic performance of students) may be the criteria for parents; job-security, job-satisfaction and pay levels may be the measuring rods of effectiveness for schoolteachers. The school head may view effectiveness in terms of his leadership abilities, teacher morale, school climate and teacher-effectiveness in addition to students' academic performance. Many groups, however, define school effectiveness in terms of a single evaluation criterion. For instance:

1. Effectiveness could be evaluated as the degree to which the school realizes its goals.
2. Effectiveness of a school can be evaluated in terms of survival of the school.
3. School effectiveness can be evaluated to the extent to which the school, given certain resources and means, achieves its objectives without placing undue strain on its members.
4. Effectiveness can be evaluated in terms of the schools' ability to mobilize its centres of power for action, production and adaptation.

School effectiveness requires multiple criteria, employing different characteristics, for its evaluation, because effectiveness is not a one-dimensional concept that can be precisely measured by a single, clear-cut criterion. Anybody can form as many criteria for measuring effectiveness. And it is also true that all criteria cannot be relevant to every school, nor can all precisely and accurately be measured. Since school effectiveness is a very broad concept, so in the present study it is confined to only two of aspects, i.e., academic performance of the students and teacher-effectiveness.

The effect of teacher-freezing on school effectiveness was studied at two levels (students and teachers) :

I. Effect of teacher-freezing on academic performance of students.

II. Effect of teacher-freezing on teacher effectiveness.

Objectives

The study was conducted with these twin major objectives:

- To study the impact of teacher-freezing on elementary students' academic performance.
- To investigate the effect of background variables of elementary students on the perception of their teacher's level of freezing.
- To investigate the effect of teacher-freezing on the teacher-effectiveness of elementary school teachers.
- To study the effect of background variables of elementary teachers on the perception of the relationship between their level of freezing and teacher-effectiveness.

Design of the Study

The study was undertaken with twofold objectives. In order to achieve these objectives, the study was divided into two major stages. These stages were called 'levels'. A brief description of each level of the study is given below:

Levels of the Study

Level I The impact of teacher-freezing was investigated on elementary students' academic achievement.

Level II The effect of teacher-freezing on teacher-effectiveness of elementary schoolteachers was investigated.

Methodology

The following variables were chosen for the study :

I. Dependent Variable

  1. School - Effectiveness (at two levels) :

    a. academic achievement of students

    b. teacher-effectiveness.

II. Independent Variables

  1. Teacher-freezing:

III. Background/Situational Variables of Students

(1) Sex, (2) Type of school ,(3) Medium of instruction, (4) Size of school, (5) SES, (6) Size of family, (7) Ordinal position, (8) Type of family.

IV. Background/Situational Variables of Teachers:

(1) Sex, (2) Teaching experience, (3) Subject specialization, (4) Type of school, (5) Size of school, (6) Type of family, (7) Size of Family, (8) Educational qualification, (9) Age.

Major Hypotheses

The following major hypotheses were postulated for statistical testing:

1. Background variables such as sex, type of school, medium of instruction, size of school, SES, size of family, ordinal position and type of family do not account for significant differences in elementary students' perception of their teacher's level of freezing
2. Situational variables such as type of school, type of family, size of family, size of school, educational qualification, subject specialization, teaching experience, age and sex do not account for significant differences in elementary school teachers' perception of the relationship between their level of freezing and their teacher-effectiveness.
3. There is no significant relationship between teacher-freezing and the academic achievement of elementary school students.
4. There is no significant relationship between teacher-freezing and the teacher-effectiveness of elementary school teachers.

Sample

The total number of elementary school students and teachers of Bangalore City constituted the population for the study Out of the total student and teacher population, a sample of 200 students and 125 teachers was selected from different types of school, namely private aided, private unaided and government, giving equal representation to both the sexes Since the aim of the study was to study both the sexes from all three types of schools, the stratified. proportionate random sampling procedure was employed.

Analysis of the Data

Level I

Effect of Teacher-Freezing on Academic Performance of Students

Initially, the teacher-freezing scale was re-worded and modified to be used for students. The modified scale was tried out on a sample of 200 elementary school students, giving representation to sex and types of school management. After the try-out, item total correlation was computed to select the items. Only 57 items got selected (out of a total of 74 items) which had an 'r' value of 0.5 level and higher. Two types of reliabilities were established, test-retest and split-half. The reliability co-efficients were found to be 0 61 and 0.73, respectively.

After the standardization of the scale, the teacher-freezing scale was administered to a sample of 200 elementary school students, and their academic performance in the previous final exams and in the mid-term exams was collected along with the responses on the teacher-freezing scale. The data was scored and analysed for the 179 completely responded questionnaires The results are presented in Tables 1 and 2.

Level II

Effect of Teacher-Freezing on Teacher-Effectiveness

The teacher-freezing scale along with the teacher-effectiveness scale was administered to a sample of 125 elementary schoolteachers The analysis and results of the data are presented in Tables 1 and 2.

Table 1 shows the elementary school students with varied background perceiving their teachers' level of freezing. It indicates that elementary students' sex does not account for significant differences in their perception of their teacher's level of freezing, since boys and girls do not differ significantly. It also indicates that management does makes a difference in their perception. Students belonging to government schools perceive their teachers to be more freezed than their counterparts from private aided and private unaided schools. It can also be seen from the same table that medium of instruction, size of school, SES, ordinal position of elementary students and type of family do affect students' perception of their teachers' level of freezing. Elementary students with English medium, small size of school, High SES, last-born and nuclear family backgrounds perceive their teachers to be more freezed than their counterparts. Whereas size of the family, whether large or small, did not affect the elementary students' perception of their teachers' level of freezing.

TABLE 1

Standard Deviation and 't' value of Elementary School Students' Perception of Their Teachers' Level of Freezing Belonging to Different Situational and Background Variables

Sl.	Variable	*Elementary Students (N =179)*			
No.		N	X	SD	't'
1.	Sex				
	a. Male	84	108	16.30	0.43NS
	b. Female	95	167	14.40	
2.	Type of School				
	a. Private aided	69	100	14.51	1.78NS
	b. Private unaided	72	104	11.89	
	c. Private aided	60	100	14.51	30.00**
	d. Govt./Corporation	38	108	17.01	
	e. Private unaided	72	104	11.80	28.50**
	f. Govt./Corporation	38	108	17.01	
3.	Medium of Instruction				
	a. Kannada	81	140	13.30	15.77**
	b. English	98	171	12.83	
4.	Size of School				
	a. Large	120	160	18.32	8.30**
	b. Small	50	180	13.78	
5.	SES				
	a. High	106	188	13.08	12.15**
	b. Low	73	156	13.78	
6.	Size of family				
	a. Large	64	140	17.40	1.53NS
	b. Small	115	153	15.58	
7.	Ordinal position				
	a. First born	66	143	14.60	10.87**
	b. Last born	70	168	12.01	
	c. First born	66	140	14.60	1.17NS
	d. Middle born	43	137	11.89	
	e. Middle born	43	137	11.80	12.14**
	f. Last born	70	168	12.01	
8.	Type of family				
	a. Joint family	81	153	13.14	3.35**
	b. Nuclear family	98	160	14.81	

* = Significant at/beyond 0.05 level
** = Significant at/beyond 0.01 level
NS = Not significant

Table 2 shows the relationship between teacher-freezing and school effectiveness in two aspects: (1) academic performance of students, and (2). teacher-effectiveness

TABLE 2

Showing Co-efficient of Correlation Between Teacher-freezing and School Effectiveness

S. No.	*Variable*	*N*	*df (N-2)*	*'r*	*Level of significance*
1	Elementary Level				
	Academic performance of students	179	176	-0.42	p > 0.01*
	Teacher effectiveness	120	118	-0.47	p> 0.01*

* Probability greater than 0.01 level of significance (significant beyond 0.01 level)

The table indicates that both elementary and secondary school students' academic performance is strongly and negatively related to teacher-freezing, which is significant beyond 0.01 level of probability indicating that higher the student's perception of their teacher's freezing, lower will be their academic performance and vice versa. It can also be seen from the same table that teachers from elementary level perceive that their teacher-effectiveness is strongly and negative correlated to their teacher-freezing. There is a negative relationship between teacher-freezing and teacher-effectiveness which is significant beyond 0.01 level of probability. It indicates that the higher the teacher-freezing, the lower will be the teacher-effectiveness and vice-versa.

In conclusion, it can be inferred that to enhance school effectiveness, teacher-freezing should be reduced.

Table 3 indicates the relationship between teacher-freezing and teacher-effectiveness of elementary school teachers with varied backgrounds.

TABLE 3

Co-efficient of Correlation between Teacher-freezing and Teacher - effectiveness of Elementary School Teachers with Different Backgrounds

S.No	*Variable*	*Elementary Teachers*		
		N	*df (N-2)*	*r*
1.	Male teachers	64	62	-0.28*
2.	Female teachers	56	54	-0.20NS
3.	Senior teachers	52	50	-0.36**

4.	Junior teachers	68	66	-0.19NS
5.	Arts teachers	77	75	-0.24*
6.	Science teachers	43	41	-0.17NS
7.	Private school teachers	45	43	-0.18NS
8	Private unaided school teachers	50	48	-0.19NS
9.	Govt./Corp. school teachers	25	23	-0.51**
10	Large school teachers	43	41	-0.31*
11	Small school teachers	77	75	-0.20NS
12.	Nuclear family teachers	86	84	-0.20NS
13.	Joint family teachers	34	32	-0.34*
14.	Small-size family teachers	74	72	-0.18NS
15	Large-size family teachers	46	44	-0.28*
16.	High-qualified teachers	49	47	-0.20NS
17.	Required-qualified teachers	71	69	-0.24*
18.	Older teachers	79	77	-0.30**
19.	Younger teachers	41	39	-0.24NS

* = Significant at /beyond 0.05 level ** = Significant at / beyond 0.01 level
NS = Not significant

It can be seen from Table 3 that elementary school teachers' freezing and teacher-effectiveness with varied background variables is negatively related. It also indicates that the effectiveness of male, senior, Art, government school management, large-sized school, joint family, large-sized family, required-qualified and older teachers' is affected more negatively and significantly (beyond 0.05 and 0.01 level) by their teacher-freezing than the effectiveness of teachers with junior, science, private school management, small-sized school, small-sized family, high qualified and young background.

Suggested Remedial Measures for Teacher-Freezing

The following are some of the suggested measures to minimise teacher-freezing.

Enhancing Human Relations

The educational leader (headmasters) of today must steadfastly maintain a human relations point of view. He should address himself to: (1) social-psychological conceptswhich emphasize the need for interaction, and (2) common application to supervision, including co-operation, good manners, a democratic approach, professional ethics, recognition, shared decision-making and empathy He should recognise that bureaucracy presents both a threat and a challenge to human relations practices. He should try his best to enhance the human relations among the different components of a school (authorities, teachers, students, parents and community).

Increasing Job Satisfaction

Unless teachers have social status and security of job and job satisfaction, they will be apathetic to the schools and to the very educational system A dissatisfied teacher spells disaster for the country's future. Dissatisfaction is suicidal in the teaching profession. Therefore, attempts should be made to rectify the conditions so as to make teachers contented, happy and effective And this will reduce teacher-freezing to some extent

High Morale

This is one of the factors which reduces teacher-freezing In schools in which faculty morale is high, teachers make excellent use of all auxiliary services because they know the process of instruction is thereby enriched. Teachers characterised by high morale are generous with praise for colleagues, show objectivity, have a helpful attitude, and are constructive and positive. These qualities are needed to enhance the teacher quality and reduce teacher-freezing.

Participation in School Administration

All teachers have a vital interest in what their school does because it affects their personal welfare and professional status. All teachers, directly or indirectly, should have a voice in any decision made by the school. Participation in school administration and decisions brings participation in responsibilities. If decisions are made by others (heads), the teacher's reaction will range from indifference and boredom to hostility; if decisions are made by a group of teachers, and if they are allowed to participate in all matters of school administration. it encourages quality work and reduces teacher-freezing.

Open Organisational Climate

This type of climate which is characterised by a democratic approach and is sympathetic, responsive, imaginative, creative, change-oriented and supportive of interaction, freedom and is in favour of divergent thinking automatically minimises teacher-freezing.

Better Physical Environment

It has been known that physical comfort helps to create a satisfactory atmosphere. Therefore, physical distractions should be reduced to a minimum. The physical facilities should not only include sufficient accommodation, lighting, comfortable temperature, etc., but should also include proper library and laboratory facilities, availability of audio and visual aids and instructional materials. This will motivate the teachers to innovate and will reduce freezing.

Stimulating Self-Improvement

Rewards for self-improvement are not to be neglected. The headmaster must provide support. He must be complementary when genuine effort is exhibited and offer constructive suggestions when the efforts seems to founder Teachers should be encouraged to use the freedom and initiative they have to build upon what they have done. They can be introduced to the excitement of experimentation or anticipating outcomes, or being aware of outcomes that were not expected. There is also great satisfaction in knowing that one is growing in competence and knowledge. Such knowledge reinforces the desired change and reduces teacher-freezing.

Recognition

Among the basic psychological needs is recognition. Sometimes people need recognition so intensely that they drive themselves to extremes in order to obtain it Recognition properly accorded to teachers helps to main self-respect: it builds status within a given group; it provides job satisfaction. With these positive effects, recognition can reduce teacher-freezing.

Building Security and Confidence

Insecurity begets fear and lack of confidence. Administrators, parents and other concerned personnel should provide full support for trial and error and to experimenting with things; teachers should be encouraged and motivated to repeat experiments again and again until-they succeed. This builds security and confidence among teachers and reduces-freezing.

Enhancing Professional Growth of Teachers

Teaching begins in the pre-professional period and develops as the individual matures A programme of guiding and stimulating all teachers to continue their preparation is necessary. Professional growth of teachers can be enhanced through in service training programmes by providing the opportunities to participate in seminars and conferences and to associate with professional organisations. These contacts will motivate teachers to use their potentialities to the best extent and will reduce freezing.

Leadership Style

The leadership style should be based upon the democratic approach, which should encourage group work, group responsibility and individual leadership. Favouritism should be avoided on the basis of caste, sex, background, etc Each teacher should be made to feel that his individual abilities, needs and interests are important. Agendas for meetings should be cooperatively planned. Credit for a job well done should be given to teachers who do the job well. This reduces teacher-freezing to considerable extent.

Reducing Frustrations

Attempts should be made to investigate the personal and job factors leading to teacher frustration. Enhancement of all the other earlier mentioned factors will naturally reduce the frustration of teachers, and in turn, teacher-freezing.

Implications

Technological, scientific and social changes are taking place in all walks of life at an unprecedented rate and educational institutions are no exception to it. With the present geometric progression of knowledge, population, technology and social change, stability has become a thing of past and our teachers inability and lethargy to cope has caused much frustration in terms of deteriorating standards of education as reflected in our students' inability to meet the demands of the new scientific and technologically-oriented society.

Today's children should be educated to live in a society that probably does not yet exist and they should be prepared for careers that are yet unknown As educational leaders, the teachers should shoulder the responsibility of bringing about the changes. The future will demand citizens who have learned to think than to memorize So our teachers should learn new ways of approaching and utilizing knowledge The teacher's continuing effectiveness will depend on his ability to solve problems, to continue learning and to adopt to changing conditions. But, unfortunately, our teachers have not realised their responsibility towards building a progressive nation. Our dream of making our students fully equipped with the required knowledge and skills will not come true unless our teachers realise their role and become effective. Our teachers do not like to realise their responsibility since they are freezed.

Teacher-freezing not only affects the quality of students and the school, but also the entire educational system. The teacher has powerful and abiding influence in the formation of the character of every future citizen. Teacher-freezing spells disaster for the country's future. Freezing among the workers in any profession is undesirable and dangerous, and it is suicidal if it occurs in the teaching profession. One of the urgent needs of the day is not only to trace the specific causes for teacher-freezing, but also to suggest tangible measures to rectify the conditions so as to make the teaching profession contented, effective and innovative.

In the present study not only the level of teacher-freezing and specific causes for it have been found out, but remedial measures are also suggested These measures should be taken seriously to eliminate teacher-freezing and to make our educational system useful and effective.

Conclusions

The teacher is accorded an important place in the learning process. He is the prime mover in the development of optimum conditions for learning. Since many persons affirm this principle and communities generally support it, one might reasonably except that every kind of aid possible to enhance the teacher's work would be made available. Unfortunately, this is not usually the case. Communities want good schools, and people say they want a quality education for their children, but they often deny the teacher the materials needed to teach and meet the challenge of learning — the salaries, working conditions and promotional opportunities that would permit concentration on the job of teaching, the time and encouragement to do the work, etc.

Excellence in teaching, research and innovation is dependent upon excellence in other institutional departments and facilities. Some of the unattended factors mentioned earlier have lead to teacher-freezing. Attempt should be made to eradicate the causes for teacher-freezing and if teacher-freezing gets eradicated, automatically school effectiveness will be enhanced.

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21

A TOOL FOR THE ONGOING PARTICIPATORY ROAD MAPPING OF THE ORGANIZATION DEVELOPMENT OF EDUCATIONAL INSTITUTIONS

Elizabeth Mehta; E.R. Prasad

The school development programme of the Aga Khan Education Service of India had developed a road-mapping tool which could be used in school-based development in the management process of DPEP The tool was based on the principle that development was to be viewed as multi-dimensional and not an all-or-nothing-situation. It was suggested that the tool with appropriate modification and fine tuning could be used for monitoring the DPEP Programmes. The participatory mode of working at every level in the DPEP organisation structure would bring in the required relative autonomy at the village level.

Origin and Development of the Tool

This tool was initially developed by the School Development Programme (SDP) of the Aga Khan Education Service, India (AKES—I) based on the leanings culled out of eight years of school based development work. The original Road-Mapping tool was based on the eleven identified key parameters for school-based development as given in Table 1.

After pilot testing, this has now been modified for use by the parent management body as it was felt that reflective processes could only be sustained at the school level if simultaneously the parent management body, i e., AKES—I, also undertook similar work. In the management tool we have finally arrived at the following eight

TABLE 1

Key Parameters of School-Based Development (At the School Level)

I. **Teaching and Learning**
   a. Institutionalization of the Process of Reflective Practice at all Levels
   b Inservice Training Within the School System

2. **Organization and Management**
   a. The Process of Envisioning and Strategic Planning Involving a Cross- Section of Stakeholders
   b. The Building of Independence Through Strong Facilitatory Leadership and Shared Decision-Making
   c. Evolution of Systems and Structures to Meet Organizational Objectives
   d. Development of Financial Self-Sustainability

3. **Ethos and Culture**
   a. Openness to External and Internal Evaluation
   b. Commitment to Process Documentation
   c. Sustainability Through Outreach

4. **Equality of Opportunity**
   a Needs-Based Growth to Meet Organizational Objectives
   b Involvement and Support of all Stakeholders

parameters which were evolved from, and dovetail into the earlier eleven These are given Table 2.

TABLE 2

Key Parameters of School-Based Development (At the Management Level)

1. **Structure**
   a Organogram
   b. Rules, Regulations, Policy and Procedures

2. **Systems**
   a. Finance
   b Documentation

3. **People**
   a. Performance Appraisals
   b Training

4. **Process**
   a. Planning
   b. Leadership/Decision-making

An organization that is seeking to change will never be able to work on all parameters at an equal pace. Hence it is useful, periodically, for the participants in any change process to assess the level they have reached on each parameter. In order to do this, a tool has been evolved with five descriptive paragraphs for each parameter, ranging from level zero where no development has been undertaken, to level four — the ultimate goal. The procedure is for the core team of the institution to reach a consensus for each parameter as to which description best matches the current level of the organization, the principle behind the tool, being that development is to be viewed as multidimensional and not an all-or-nothing situation.

It is this tool which we have successfully tried out in our own organization for the road mapping of effective management processes, that the team feel would be appropriate, with further fine tuning, for the District Primary Education Programme (DPEP) to use at perhaps the State, the Block and the District levels, to monitor and give a sense of direction to the participatory processes within the government hierarchy. Our experience leads us to believe that the relative autonomy that is required at the village level in order to facilitate creative action can only be sustained if every level in the DPEP organizational structure works in such a participatory mode.

Utilization of the Tool

Stage I

Identification of the Levels at Which Participatory Self-appraisal Can be Undertaken in the DPEP Organizational Structure

Those personnel who interact on a regular, even if intermittent, basis need to be identified for each level.

Stage II

Organization of Forums to Conduct Participatory Assessment of Organization Development

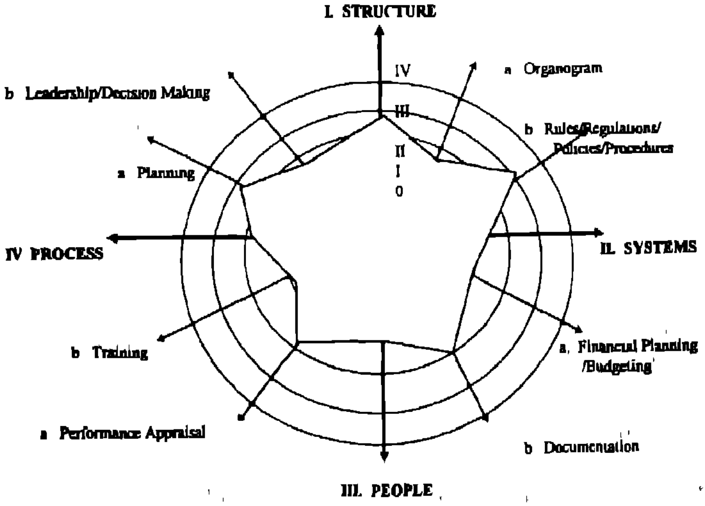
It is estimated that one full day would be required for the process at each level within the DPEP organizational structure. This could be broken up into two half-day workshops depending upon the practicalities of the situation, always bearing in mind that it may be difficult to sustain a high energy level over longer periods of time.

Stage III

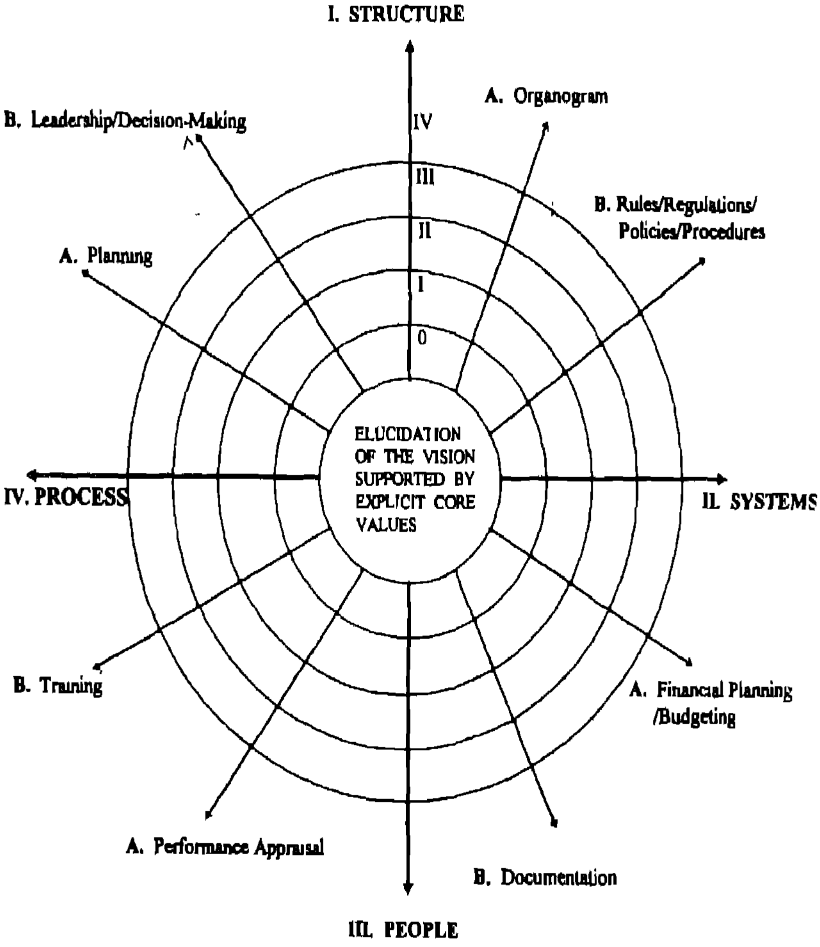
Consensus-building on the Perceived Stage of Growth and Development on Each Parameter

The tool should be given to each participant in the group and considerable time devoted to ensuring that a common understanding is reached of each paragraph relating to the particular level on each parameter. The facilitator explains to the group that the decision *vis-a-vis* the level has to be a consensus decision. No description of a level can ever totally fit the current status of an organziation Sections of other levels may also be deemed appropriate, but the task is to select the description that most nearly describes the current status of the school. An explanation of consensus-building is given to the group, so that they begin to take up for discussion differences in perception with a view to convincing one another. The resulting level is not to be given on the basis of an average — but must be the consensus-decision of the entire group This process leads to much meaningful discussion that would over a period of time enhance a commonality of vision within an organization.

As consensus is reached on each parameter it should be mapped, resulting in a circular web similar to the one given below:



Worksheets for recording both the individual and group assessment along with associated action plans for improvement are provided with the tool at the end of this paper in the Annexures.


I. STRUCTURE
A. Organogram
B. Leadership/Decision-Making
IV
III
II
I
0
B. Rules/Regulations/ Policies/Procedures
A. Planning
ELUCIDATION OF THE VISION SUPPORTED BY EXPLICIT CORE VALUES
IV. PROCESS
II. SYSTEMS
B. Training
A. Financial Planning /Budgeting
A. Performance Appraisal
B. Documentation
III. PEOPLE

N.B. : When using the tool, please treat the following terms as having the measings as indicated below.

Management	The decision-making bodies, and needs to be defined contextually.
Professionals	individuals directly involved in implementation of the various Programmes
Staff	individuals who provide support to the professionals
Employees	Professionals + Staff.

Stage IV

Implementation of Action Plans

The organization should then attempt to implement their Action Plans in order to raise their level of development on deficit parameters.

Stage V

Second Cycle of Road Mapping for Reviewing of Progress

These cycles should continue on an annual basis to ensure that the development process is sustained

(We would like to record here our gratitude to all those within our schools and to the parent organization, AKES—I, who during the last eight years of our School Development Projects have added to our learnings and hence facilitated the development of this tool. Special mention should be made of Ms. Kavita Anand, former Dissemination Consultant, SDP and Ms. Leila Parker, Documentation Specialist/Process Evaluator, SDP.)

Levels in the Unfolding of the Vision at the Organizational Level

I-Structure

IA. Organogram

Level 0	A rigid hierarchy with traditional unquestioned systems controlling the functioning. Structure and systems review is never done, to see if they are serving organizational objectives.
Level 1	Attempts are made to create new systems and structures, to satisfy organizational objects. Old systems and structures coexist with the new ones, and this often leads to conflict, confusion reigns Due to lack of clearly defined roles/responsibilities/accountabilities, the old systems and structures tend to fragment functioning.
Level 2	Old systems and structure are questioned, reviewed and modified. Gradually, most of the defunct old systems and structures are replaced by new ones. The new systems and structures that are set up are constantly questioned, reviewed and modified to achieve organizational objectives

and enhance clarity of roles/responsibilities/accountabilities The new modified systems tend to give problems, often being time-consuming. Inadequate induction into the new systems leads to suspicion.

Level 3 · Systems and structures begin to stabilize The new systems and structures have developed a better understanding of roles/accountabilities/responsibilities. This has facilitated team-work and the integration of various diverse areas of work. Conscious efforts are made to see that new systems and structures do not become too rigid/hierarchical, and this often becomes time-consuming Documentation of the new systems and structures begins.

Level 4 : The new systems and structures integrate completely with the functioning of the organization. Flexible and adaptable systems and structures have been introduced that ensure effectiveness in all organizational processes The new systems and structures are responsive to change and ensure that speedy decisions can be made at the point in the organization structure, where they will add to organizational effectiveness in terms of goal achievement.

IB. Rules/Regulations/Policies/Procedures

Level 0 . Employees strictly adhere to rules, regulations, policies and procedures out of fear and to keep out of trouble. Rules, regulations, policies and procedures are followed, irrespective of utility, and no initiative is taken to rectify shifting rules, regulations and procedures Complacency is all pervading and employees do things because that has been the way it has always been done. Very little freedom to act is provided to employees and the Management's role is evaluative and negative in nature.

Level 1 . A few employees feel uncomfortable regarding the various rules, regulations, policies and procedures and voice their concerns informally, but very little is done about it. Occasionally, sporadic attempts are made to discuss issues, policies, procedures, rules and regulations in a formal set-up, but no action is taken by the management to improve the situation. Attempts are more in the direction of placating the employees, rather than arising out of the Management's concern for the employee. The organization lacks direction and positive leadership

Level 2 : Employees and Management begin to feel the need for change in the various rules, regulations, policies and procedures. There is consensus on the need for positive reflection on various organizational issues (rules, regulations, policies and procedures). Forums are made and meetings conducted, to reflect on various rules, regulations, policies and procedures, but are not focussed due to lack of goal clarity Meetings and forums are considered a waste of time and sacrificed in the pursuit of more urgent matters.

Level 3 Employees proactively seek opportunities and create forums for sharing and problem-solving on various organizational issues (rules, regulations, policies and procedures). Individuals make suggestions regarding the rules, regulations, policies and procedures, as to what needs to be done, and try to find the appropriate channels to mobilize support and resources Management is more understanding and the organization is encouraged and motivated to think creatively regarding the rules, regulations, policies and procedures, and search for new ways of doing things Management is open to questioning and critical comments from employees regarding the functioning of the organization and the corresponding rules, regulations, policies and procedures, but only in specifically created fora for the same.

Level 4 : Employees begin to respect the functioning of the organization and the existing rules, regulations, policies and procedures. Management begins to respect employee suggestions and take prompt action whenever required, treating them as partners in the continuous/positive evaluation of the organization. Assessment of the organization is done in a systematic manner and employees are constantly encouraged to ask questions. There is a general feeling of team-spirit and the organization reflects a climate of growth, development, creativity and participatory management in deciding rules, regulations, policies, procedures. Time is slotted to create an open-house system, wherein employees at any level in the organization are permitted to directly approach the Management on issues concerning rules, regulations, policies and procedures.

II-Systems

IIA. Financial Planning/Budgeting

Level 0 Finance is viewed as a management concern. There is no involvement of the staff in budgeting exercises.

Level 1 Senior Personnel participate in a limited way, in the budgeting exercises, but the final budget is prepared by the Management. Not having the overall picture, financial planning is haphazard Prioritizing, in the process of preparing the budget, is not effectively done, leading to inefficiency and waste.

Level 2 Management shares the budget with senior personnel, such that annual action plans and cash flow projections can be correlated. Due to inadeqate involvement of staff down the line and lack of systems, effective financial planning is lacking. Due to lack of skills/knowledge and involvement in the budgetary process, avoidance reactions are common.

Level 3 Management involves Senior Personnel and a few members of the staff in budgeting exercises and establishing financial systems. Senior personnel and few members of the staff take on ownership of the budgetary process and financial systems. Complete awareness of financial systems and the corresponding larger organizational goals does not exist. Often, unreasonable demands continue to be made on the systems, due to inadequate awareness of financial systems and lack of involvement of members of the staff.

Level 4 Responsibility for effective financial decision making is developed at the departmental level. Departmental staff participate in the budgeting exercises, along with the Management and Senior Personnel. Financial systems are accepted as contributing to organizational effectiveness and the organization is cost conscious, whilst simultaneously quality-conscious. Awareness of the relation between financial systems and the larger goals of the organization leads to very few unreasonable demands.

IIB. Documentation

Level 0 : Documentation is limited to routine reports and informal minute writing. Essentially, it is done because the management requires it There is no system of classifying and storing data

Level 1 Individuals in the organization begin to recognize that the existing systems of documentation are inadequate, but are not clear as to what is appropriate Though a system of documentation exists, it is merely a system of classifying and storing data, retrieving data is a time-consuming process. Minute-writing is formalized, but its purpose is till not clear. Minutes are often written at the last moment, sometimes just before the next meeting. People do not get enough time to read the minutes, and plan appropriately. Minutes tend to be lengthy/ unfocussed, due to lack of skills in minute writing. There are no personnel accountable/responsible for documentation.

Level 2 . Individuals begin to develop more meaningful and purposeful formats for documentation. Written records are maintained systematically and organized effectively, reducing the time taken to retrieve data. Minutes are seen as useful documents for the monitoring process and accountability There is focus on developing minute-writing skills Personnel, responsible for documentation, have been recruited to establish effective documentation systems (documenting data, information and processes), but do not have well-defined roles

Level 3 : The organization develops newsletters and other forms of communication for effectively documenting organizational information and processes. Documentation is seen as a channel for receiving/giving feedback regarding various organizational processes and activities. Well-defined systems exist for effective documentation, that have incorporated the use of various audio/visual channels. The process of documentation is seen as a system to facilitate the decision making and problem-solving processes. The role of the documentation specialist is well defined

Level 4 : Documentation is viewed as an important channel for the reflective functioning of the organization. It offers insights into the organization and systematically classifies the various developments that have taken place/are taking place in the organization over a period of time. The process of documentation has become a part of the core systems and has been internalized into the functioning of the organization. It is a meaningful exercise for monitoring, research studies induction of personnel and for dissemination

III-People

IIIA. Performance Appraisals

Level 0· There is no system of formal appraisal/assessment. Performance evaluation is done on an *ad-hoc* basis and is individual-based. Employees are extremely apprehensive of any appraisal or evaluation being done. Rewards at the end of the year are given based on personalities and mutual preference, rather than on competence, if given at all.

Level 1 · Formal appraisal system exists, but employees do not appreciate its value. Though the Performance Appraisal system exists, it is rarely employed and never regularly. The Appraisal is used more as a reward-and-punishment tool, rather than a developmental tool. Rewards are given on an *ad-hoc* basis. Senior Personnel do not possess adequate skills for the effective implementation of Performance Appraisals Appraisals are done based on personalities, and not on competence and seen as a waste of time

Level 2 : A few employees begin to realize the importance of Performance Appraisals and need for assessment. The Appraisals are conducted on a yearly basis, but deadlines are generally not met during objective-setting. Adherence to the steps in the Appraisal process is not taken seriously, and personnel tend to overlook various critical criteria Senior Personnel are not fully trained in the appraisal/feedback process and not able to provide or receive constructive criticism. Appraisals are seen by the majority as a reward-and-punishment tool.

Level 3 Senior Personnel are well trained in the Appraisal Process. Senior Personnel understand its utility and effectiveness in achieving organizational goals and are committed to transferring this knowledge and enthusiasm to people down the line Though the system still needs to be internalized by employees, the tool is being looked at more and more as a positive developmental tool Appraisals are being carried out on a yearly basis and all involved adhere to the various steps and deadlines involved in the Appraisals process. Attempts are made to introduce Self and Upward Appraisals as part of the Appraisal Process, without much success due to lack of openness

Level 4 . Performance Appraisals are an integral part of the system and viewed as a tool for continuous growth and development. Formally, appraisals are conducted once in three months, and informal appraisals are conducted once a month. Openness and trust pervade the Appraisal process and employees participate enthusiastically and willingly. Senior Personnel are well trained in the Appraisal process and assist subordinates to conduct Self-Appraisals Both Management and Senior-Personnel (appraisers) are open to upward appraisals and it becomes a regular annual feature of the appraisal process

III B. Training

Level 0 There is a general feeling that preservice qualifications are more than sufficient to do the job. Most employees are very low on managerial and organizing skills, and do not possess adequate job knowledge. Occasionally, a few employees (only at the Senior levels) are sent for external training programmes (decided by the Management). Training programmes are not need-based, and there is no follow-up and evaluation of training effectiveness/relevance "Frog in the well" and "It has to be done, and so it is being done" is the attitude of the employees and Management

Level 1 · Management involves senior personnel in deciding what training is required and a few employees are sent for training programmes (external workshops). Most training programmes are not need-based, except in rare cases and there is no adequate feedback mechanism to assess training effectiveness/relevance. Employees have adequate job knowledge, but are very low on managerial and organizing skills. A few employees and a couple of members in the Management genuinely begin to feel the need for training, and occasionally voice their opinions.

Level 2 . Senior Personnel and Management genuinely begin to feel the need for training programmes and attempts are made to assess training needs. Assessment of training needs is done based on personal relationships, and not in a systematic and regular way. There is a general focus on developing organizing and managerial skills, and updating job knowledge. Workshops are conducted in the organization, but with external faculty. Objectives of the workshops are decided upon by the Management/Senior Personnel, and feedback regarding the training programmes is taken in an informal way. Employees are then expected to implement new and innovative ideas, without adequate resources - men, material or money. There is a general feeling that the workshops being conducted are not effective and fruitful, and a few individuals begin to voice their opinions.

Level 3 . Most employees and the Management genuinely begin to feel the need for training, and a Training Needs Survey is conducted. Assessment of training programmes is done in a systematic manner and formal feedback mechanisms have been set up. Employees begin to openly question the effectiveness of external workshops and suggest alternatives to tap internal resources. Employees try to implement new and innovative ideas, but are often discouraged due to lack of resources. A few employees organize and conduct internal workshops, but do so only when requested by the Management/Senior Personnel.

Level 4 : An awareness for the need for training and development exists at all levels in the organization. Employees make an effort to learn, improve and develop, and make maximum use of the resources at hand. Assessment of training needs is done regularly and jointly by employees at all levels and the Management Training requirements of the organization are assessed through an annual training needs survey and incorporate individual developmental plans in the Performance Appraisal system.

Most of the training programmes are conducted internally, by tapping internal resources and employees willingly volunteer to conduct these programmes. Occasionally, demands are made for extra resources/facilities (and at times for external workshops) for conducting workshops, which the Management/Senior Personnel readily comply with. Sharing of skills, expertise and knowledge is dominant in the organization and employees are keen to learn. Full support is provided to employees to implement new, innovative and feasible ideas for the development of the organization.

IV-Process

IVA. Planning

Level 0 . Employees do not feel the need for planning. Activities are done based on immediate need and on a day-to-day basis. We do not need to plan In this sort of an organization, due to the nature of the activities, we cannot plan.

Level 1 : Initial attempts are made at Action Planning by a few key Senior Personnel, who experience overload. Due to lack of involvement nd consensus in creating the plan, ownership is limited and implementation patchy. Most employees view Planning as not being integral to the organization's functioning· Let others do it, I don't have the time

Level 2 Senior Personnel feel the need for Action Planning. An overall organizational plan is created, though patchy and inconsistent Departmental action plans are attempted, by delegating work to employees down the line. Accountability issues creates anxiety. False starts often lead to questioning of value of the action plan A significant number of personnel still do not see the importance of a shared action plan/planning

Level 3 ' Senior Personnel are committed to the process of planning and this begins to percolate down the line. An effective and comprehensive organizational plan has been created and the corresponding departmental action plans are in place. A few success stories lead to greater confidence in the efficacy and need for a shared action plan. Most employees are fairly comfortable with the Planning process and the action plans, as accountabilities/responsibilities for activities have been well defined. There are still a few individuals who are skeptical of the Action Plan, and shirk responsibility/accountability.

Level 4 · The effectiveness and need for action plans have been well established, and departments conduct weekly planning and review meetings to enhance the effectiveness of the action plans Most employees have accepted responsibility for the Action Plan, both at the organizational and departmental level, and feel accountable for its implementation.

IV B. Leadership/Decision-Making

Level 0 : Leadership is limited to designated leaders in the Management. It is concerned with the maintenance of current systems, and the creation of an image of efficient administration. Professional representation in the Management is mere lip-service.

Level 1 · Leadership is limited to members of the Management. Professional representation in the management is increased, but role clarity does not exist. Management consults with the professionals before taking significant decisions, but does not wholeheartedly value their contributions. Ownership of the decision is often lacking due to absence of consensus and accountability. There is a tendency to bring up routine administrative issues for discussions. True partnership does not exist.

Level 2 : Management begins to perceive key Senior Professionals as part of the leadership. The professionals begin to play an important/significant role and their contribution is valued and sought for in decision making. Professional role clarity exists and accountabilities/responsibilities are well defined at the senior levels New centres of power tend to spring up, due to increased delegation of responsibility. A few fora are set up to discuss matters related to the organization (developmental and administrative) and education, though they tend to be unfocussed. Staff involvement in the decision making process is negligible. Ownership of the decisions taken and of their subsequent implementation is lacking, due to lack of staff involvement.

Level 3 : There is continuous interaction and dialogue between the Management and the Professionals Professionals begin to play an active role in the planning and decision-making processes, concerning all aspects of organization. The new centres of power are formalized and stabilize, introducing a sense of dynamism into the leadership process Various fora are set up to facilitate Professional-to-Management and Professional to Professional dialogues, for decision making, planning and sharing of learning. The quality of professional participation in the fora is of a high level, and they are effective and focussed. Staff participation is limited, though increasing, in the decision making and planning processes. Role clarity, accountabilities and responsibilities are not clearly defined at the staff level The Management encourages the professional representatives to discuss proceedings with the rest of the staff. Staff participation is encouraged, so that shared decisions have more significance Effective fora do not exist to facilitate staff involvement and sharing. There are still staff members who tend to blame the professionals/management for things not working out

Level 4 : Professionals feel empowered to take decisions, plan and take informed risks to improve the organization. Various effective fora have been set up to facilitate Management-to-Professional, Professional-to-Professional and Professional/Management-to-Staff Dialogues. Staff begin to proactively participate in the decision-making and planning processes and play an active role in implementation. A clarity regarding role and contributions exists among the Management, Professionals and Staff, and there is proactive participation at all levels Due to the element of shared decision-making and planning, decisions are generally willingly accepted. Trust pervades the organization

ANNEXTURE 1

WORKSHEET — INDIVIDUAL

Date :
Forum

Parameters	*Your Assessment (Level)*	*Group Assessment (Level)*	*Reasons for Your Assessment*	*Action Plan for Improvement*
IA. Organogram				
IB. Rules/ Regulations/ Policies/ Procedures				
IIA. Financial Planning/ Budgeting				
IIB. Documentation				
IIIA. Performance Appraisals				
IIIB. Training				
IVA Planning				
IVB. Leadership/ Decision-Making				

Please attach additional papers wherever required. Preferably, use one page per parameter in the same format.

ANNEXURE 2

WORKSHEET — GROUP

Date Forum

Parameters	*Group Assessment (Level)*	*Reasons for Group Assessment*	*Action Plan for Improvement*
IA. Organogram			
IB. Rules/Regulations/ Policies/ Procedures			
IIA. Financial Planning/ Budgeting			
IIB. Documentation			
IIIA. Performance Appraisals			
IIIB. Training			
IVA. Planning			
IVB. Leadership/ Decision Making			

Please attach additional papers wherever required. Preferably, use one page per parameter in the same format.

SECTION VII

Community and School Management

The studies discussed in this section include:

- Effects and Costs of Community Participation: Results of the Primary Education Quality Improvement Project
- Combating School Dysfunctionality Through Community Mobilization: Case Study of a Rural School
- Community Participation in Primary Education and School Effectiveness

22

EFFECTS AND COSTS OF COMMUNITY PARTICIPATION: RESULTS OF THE PRIMARY EDUCATION QUALITY IMPROVEMENT PROJECT

Bert Creemers, Greetje van der Werf

The paper aimed at studying the effects of costs of the community participation initiatives in the Primary Education Quality Improvement Programme (PEPQIP) in Indonesia as compared with the effects and costs of other activities in the project. The effects of the PEPQIP were measured with achievement tests applied to students in language and science. The study revealed that cost effectiveness of community participation is twice as high as the cost-effectiveness of teacher training.

Introduction

Community Participation is one of the main issues in the improvement of the quality of education, not only in Western countries (Moles, 1992, Crispeels, 1996), but also or especially in developing countries (Lockheed & Verspoor, 1991; Levin & Lockheed, 1993).

Community participation can refer to parents assisting children with homework and engaging in learning activities. In a broader sense it refers to mutual collaboration. Support and participation of families, community members and agencies and school staff, in the community or at school, in activities and efforts that directly and positively affect student outcomes (Crispeels, 1996).

In this paper the results of initiatives to enhance community participation in primary schools in Indonesia are analysed in comparison with other educational-improvement initiatives like training of teachers, provision of books and learning materials and strengthening the management of schools. The research questions to be answered are

1. What are the effects of community participation on student achievement in comparison with other quality-improvement measures?
2. What is the cost-effectiveness of community participation in comparison with other quality improvement measures?

Because the initiatives to enhance community participation are part of a national educational quality improvement project in Indonesia (the PEQIP Project), firstly, this project will be described shortly in the next section, with the focus on the community-participation activities.

The PEQIP Project and Community-Participation Activities

Since several decades the improvement of the quality of the educational system is an important issue for the Indonesian government. In 1992, the government initiated the Primary Education Quality Improvement Project (PEQIP).

PEQIP is aimed at raising student achievement, decreasing retention and drop-out rates and increasing enrolment in secondary education. As such, PEQIP can be considered as a school improvement project aimed at enhancing school effectiveness.

A variety of activities were carried out during the project. Books and materials were developed, funds were provided to the schools, experiments with new ways of student-grouping and teaching methods were stimulated. Teachers, tutors, principals, supervisors and educational managers participated in upgrading courses Teachers, principals and supervisors participated in work groups for teachers, principals and supervisors. These groups are a part of the school cluster (gugus) scheme. A cluster encompasses one core school (Inti) and six to nine following schools (Imbas). Each cluster has a teacher activity centre located in the Inti school, where seminars, training activities and workshops take place. The centre is equipped with audio-visual aids, educational tools and a library. An important objective of the cluster is to encourage the work groups of teachers, principals and supervisors to support professional development. All PEQIP activities were centralized in four main components: (1) Teacher Professional Development, (2) Educational Management (including Community Participation), (3) Books and Learning Materials, and (4) Evaluation and Monitoring The four

PEQIP components refer to the school variables which consistently affect student achievement in developing countries (Levin and Lockheed, 1993).

The focus of this paper is on Community Participation. Although Community Participation was included in the Management Component, it was treated as a separate component by the project and by the consultants. The idea behind the component was that co-operation between schools, parents and the community reinforces effective school characteristics such as high expectations, emphasizing the academic mission of the school, positive home school relationships and a positive, safe and rewarding learning environment (Cf. Crispeels and Coleman, 1995). Homework also was considered to be a school practice which links the role of parents and teachers (Cf. Cooper, 1989), as well as home reading programmes where parents listen to their children read or do paired reading (Cf Topping and Wolfendale, 1985. Commins, 1986).

All these ideas were included in the project activities. Training was provided by the central project management to educational managers, supervisors, principals and community leaders, and documents were provided to schools by the international consultants of the project.

Theoretical Model

During the period September 1996 until September 1997, a school effectiveness study was conducted to establish the effects of PEQIP on student achievement as well as to establish the factors by which these effects could be explained. An integrated school effectiveness model was developed which takes into account the intended output and specific inputs of PEQIP, school and classroom level process indicators of effective schools in Western countries, indicators of effective schools in developing countries and the local context of schools, teachers and pupils in Indonesia as well. The model stresses the fact that the results of education should show in effects at the student level. In the case of PEQIP, the improvement of the quality of education must show in its contribution to student achievement. PEQIP only can be evaluated as being effective if the pupils in schools participating in PEQIP achieve better than pupils in schools not participating in PEQIP. However, because pupil achievement is strongly influenced also by pupils' background characteristics like SES, intelligence, gender, motivation, etcetera, (Walberg, 1984), these variables have to be taken into account when establishing the effectiveness of education.

The model specifies the relationships between the core variables and includes context (material, non-material and financial resources), inputs (the main components of PEQIP), process variables referring to the implementation of PEQIP (quality of management, quality of instruction, books and learning materials and community participation) and student achievement (see Figure 1)

The factors at different levels of the educational system are not expected to influence outcomes directly. Instead they are supposed to provide conditions for effectiveness at the school and the classroom level. The same holds for the PEQIP interventions These are certainly supposed to influence outcomes, but by mediating other factors. The interventions must be carried out first, they have to be implemented at cluster and school level and ultimately they have to reach the classroom level The model takes the PEQIP inputs as a point of departure and arrives at student outcomes by the mediating factors.

This paper focusses on the lower level of the model (the relationship between the inputs as implemented in the schools and student achievement) The effects of community participation will be compared with the effects of the quality of management, the quality of instruction and books and learning materials, taking into account student background and school context variables. Only the core variables that are relevant for these analyses will be described shortly, with exception of community participation which is described in more detail. For more information about the variables we refer to the full report (Creemers, Van der Werf and Klaver, 1997).

Core Variables in the Analyses

Community Participation

Parental and community participation can refer to assisting children with homework at home and engaging in learning activities (Moles, 1994). In a broader sense it refers to mutual collaboration, support and participation of families, community members and agencies and school staff, at home, in the community or at school, in activities and efforts that directly and positively affect student outcomes (Crispeels, 1996). Home and community variables in the study of Suryadi (1992) affected achievement more strongly than school quality variables, whereas Moegiadi and Elley (1976) found the

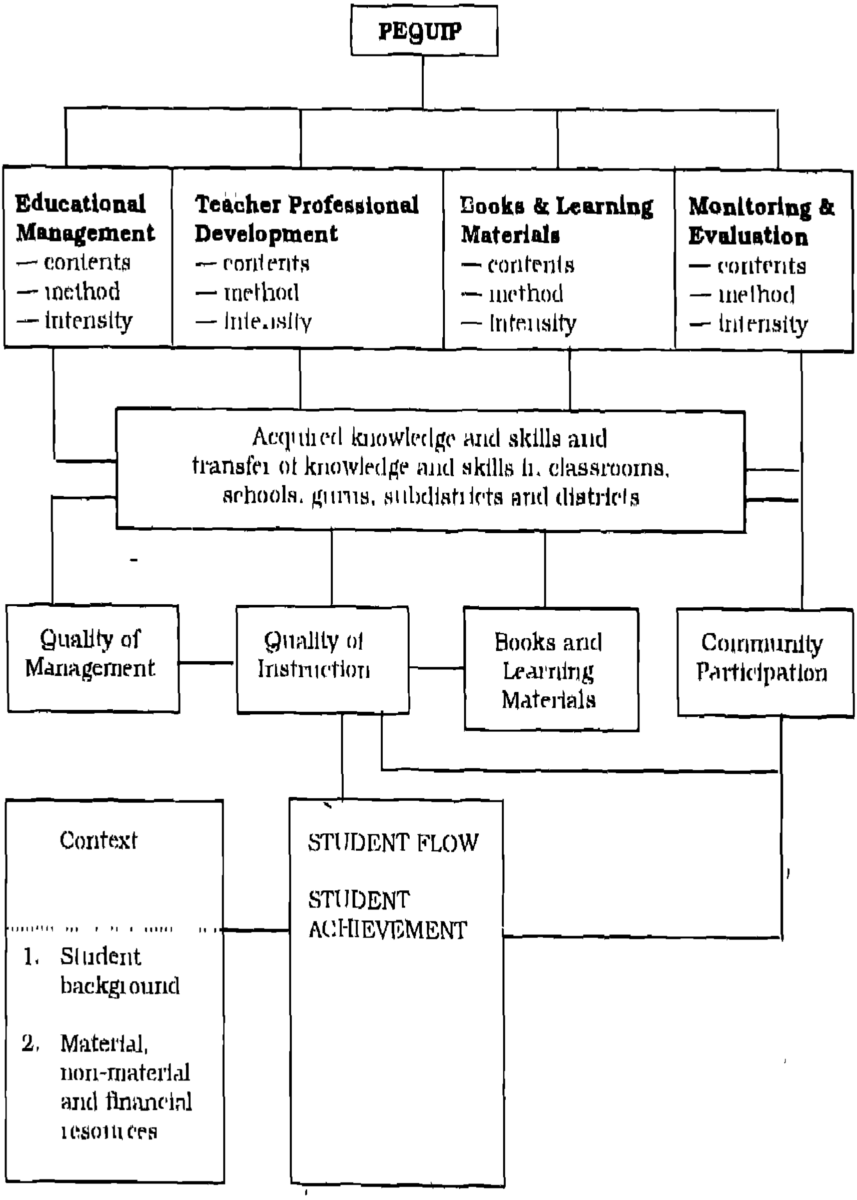


FIG 1
Research Model

opposite This difference may be caused by the economic progress which Indonesia has made over the years In low-income countries, schools affect student achievement more strongly than in middle-income and high-income countries, where the socio-economic status of the family is an important predictor of achievement.

Indicators of community participation are the intensity of contacts between schools and parents, contributions of parents to schools, involvement of parents and others in the community into educational matters and involvement of parents with homework

Quality of Management

For management at the provincial, district and subdistrict levels important indicators are a policy focussing on effectiveness, an indicator system for evaluation, guidelines for time schedules, supervision of time schedules and guidelines for the curriculum, indicators for management at school level are whether principals organize the timetable efficiently and stimulate teachers to create an orderly and quiet atmosphere and to optimize time-use in the classrooms (Creemers, 1994).

Quality of Instruction

Essential characteristics of the quality of instruction at classroom level are teacher behaviour (structuring the content, clarity of presentation, questioning, immediate exercise after presentation, evaluating whether goals are achieved and corrective instruction), grouping procedures and the use of curriculum materials (Creemers, 1994).

Elements of quality of instruction at the school level are regulations and activities in relation to learning time, regulations concerning training, evaluation and guidance of teachers, regulations with respect to student behaviour and regulations with respect to implementation of the curriculum

Books and Learning Materials

Indicators are the availability and newness of books, equipment supplied by PEQIP and the use of this equipment, and the library (amount and use of books). In line with the aims of PEQIP, student achievement in mathematics, Bahasa Indonesia and science is measured in Grade 6.

Student Background

To make a fair comparison between PEOIP and non-PEQIP schools and among PEQIP schools, the background characteristics of students that are known to affect achievement must be taken into account. The main characteristics are intelligence, social-economic status (SES), gender kindergarten attendance, home language and distance between home and school.

Material, Non-material and Financial Resources

Material resources are the finances and equipment of schools. Immaterial resources are the education and experience of teachers as well as context variables like the location or the status of the school or the percentage of low SES pupils (Suryadi, 1992).

Method : Sample, Instruments and Analyses of Data

Sample

The study was conducted in the provinces Aceh and Sulawesi Utara. Within each province, 27 PEQIP schools were selected from all three subdistricts participating in PEQIP. In each of the subdistricts 3 clusters of schools were participating in PEQIP. For the study all Inti schools in these clusters were selected as well as every third and sixth Imbas school. So in each province, 9 Inti schools and 18 Imbas schools were participating. In each province control schools were also selected, 14 in each province.

Instruments

For the study standardized tests related to the national curriculum were developed for Bahasa Indonesia, mathematics and science in Grade 6. All tests had the multiple choice format. Each test took about 50 minutes. The reliabilities of the tests are .77 (40 items), .84 (46 items) and .80 (40 items) for, respectively, Bahasa Indonesia, mathematics and science.

Indicators for student background characteristics were intelligence, social-economic status (SES), home language, gender, distance between home and school, and kindergarten attendance Intelligence was measured during the pre-test with a non-verbal intelligence test developed specifically for this study. The test consisted of 46 items for Grade 6. The reliability of the test was .85. SES was indicated by the educational level of the father (5 levels). Home language and kindergarten attendance are dichotomous variables (whether or not speaking Bahasa Indonesia and whether or not having attended kindergarten) Distance between home and school was measured in metres. Information about SES and the other background characteristics was obtained from teachers during the pre-test.

For measuring the variables with respect to the context, resources and implementation of the PEQIP inputs, a variety of instruments was developed such as a scheme for the analysis of documents, interviews, and observation instruments. Most variables were measured by interviews with different persons providing information about the same variables Community participation was measured by interviews with parents, community leaders, school principals and by observations of meetings of parents and community leaders. The data were collected by trained Indonesian researchers and by school supervisors.

The quality of instruction in the classrooms for Bahasa Indonesia, mathematics and science was observed twice by the Indonesian researchers and once by the supervisors. To establish the reliability and validity of the data, comparisons were made between the data collected by the researchers and the data collected by the supervisors. The percentages of agreement were at the average about 90% Only the correlations between the scores of supervisors and researchers on the high-inference classroom rating scale were too low Because the ratings of the supervisors were correlated more to school output variables than the ratings of the researchers, we used only the supervisor ratings in the eventual analyses. Also data from different sources were cross-validated. The interview data were compared with the observations of the researchers and supervisors as described in the school reports they had to make from each school visit. Data from interviews with different persons were compared with the observations of the researchers and supervisors as described in the school reports they had to make from each school visit. Data from interviews with different persons were compared as well In the case of discrepancies, observations were preferred above interviews and interviews with independent persons were preferred above data from school-related persons.

Results

The Effects of Community Participation on Student Achievement

To answer the question about the effects of community participation on student achievement in comparison with the effects of other improvement initiatives, the data were analysed with the multilevel programme VARCL, separately for Bahasa Indonesia, mathematics and science. First, an unconditional model - a model without pupil and school variables — was specified in order to establish the proportions of variance to be explained at pupil and at school level. Subsequently the pupil variables intelligence, SES and Kindergarten participation were specified in the model (Model 1). Speaking Bahasa Indonesia at home, distance home-school and gender were not included in the model because these variables either were not related to achievement or were related too strongly to intelligence and SES. In Model 2 the school context variables, location (rural =1, suburban=2, urban=3) and percentage of low-SES pupils were added to establish the remaining variance at school level to be explained by PEQIP Status of the school (public or private) was not related to achievement and for this reason this variable was not included in the model. In Model 3 the category of school (Inti, Imbas, Control school) was entered as two dummy variables (Inti vs control, Imbas vs, control). If one or both of the dummy variables explain(s) significantly the between schools variance in achievements, after taking into account pupil variables and school context variables, we may conclude that PEQIP indeed had effects Unfortunately, however, the effects of the two dummy variables only were significant in Sulawesi Utara and not in Aceh (see Table 1).

TABLE 1

Results' Analyses per Province; Model 3: Regression Coefficients and Standard Errors, % of Unexplained Variance and Improvement of Model fit Compared to Model 2

	Sulut Mathematics	*Sulut Bah. Indo.*	*Sulut Science*	*Aceh Mathematics*	*Aceh Bah Indo*	*Aceh Science*
Grand Mean	7.7	18.0	13.5	17.6	16 0	13.5
Intelligence	31(.03)*	.12(02)	.22(02)*	23(03)*	16(02)*	.21(02)*
SES	86(25)*	.57(17)*	.37(.19)*	65(19)*	61(.13)*	71(15)*
Kindergarten	04(.01)*	.01(.01)	.01(.01)	06(03)*	.04(01)*	.04(02)*
Location	.80(55)	39(.43)	.82(.35)*	-2.1(.9)*	-.08(.43)	.25(.56)
% Low SES	- 02(.02)	-.03(.01)*	00(.01)	03(03)	- 03(.01)*	-.04(.01)*
Inti schools	2 3(1.3)	2.0(99)*	2 7(80)*	1.1(2.2)	21(1.03)	1 1(1 3)
Imbas schools'	1(1.3)	-1.0(99)	1.5(.80)	1 9(1.9)	.64(.89)	1.6(1.1)
Var Pupil level	55%	56%	64%	46%	49%	45%
Var School level	14%	20%	10%	27%	12%	15%
Tot Var Unexplained	69%	76%	74%	73%	61%	60%
Diff Model Fit	3.7(ns)	8.1*	10 2**	1.3(ns)	.8(ns)	2 4(ns)

Sulut = Sulawesi Utara * p, 05, ** p< 01

The table shows that in Aceh there are no effects of PEQIP. For all three subjects the model with the two-dummy variables does not significantly fit better than the model with only student background and school-context variables, and the regression coefficients of the two dummy variables are not significant. In Sulawesi Utara, the model fit improves significantly if the two dummy variables are included in the model for Bahasa Indonesia and science, but not for mathematics.

So PEQIP was effective only in Sulawesi Utara. For this reason it makes sense to explain the effects only in this province with variables measuring community participation and the other PEQIP inputs, and only for Bahasa Indonesia and science schools and 756 pupils.

First, we selected the community participation and other PEQIP implementation variables that, according to F-tests and X^2-tests differed significantly ($p<.05$) between PEQIP and control schools. These variables may be considered as indicators of the implementation of the PEQIP inputs in the practice of schools and classrooms. The selected variables are in Annexure 1, organized according to the PEQIP inputs, Community Participation, Management, Evaluation and Monitoring, Teacher Professional Development and Books and Learning materials. These variables were entered in the model with pupil and school-context variables (thus without category of school) in two steps; in the first step we entered the school-level variables (Model 4) and in the second step the classroom variables (Model 5). In these models kindergarten attendance was not included because this variable appeared to be related too strongly to the location of the school and to the percentage of low-SES pupils Subsequently, all school and classroom variables that were significant in Models 5 and 6 were entered at the same time (Model 6). The variables in Model 6 are different for the two subjects depending on their significance in Models 4 and 5. In the final model (Model 7) category of school was entered again, in order to establish whether Category of School still explains between-schools variance If not, we may conclude that the variables measuring the implementation of community participation and the other PEQIP inputs are the factors that explain the effects of PEQIP. In Table 2 the results of the last two models are presented, per subject. If a variable is not included in model 6 and 7 because it was not significant for that subject in the former models that variable is indicated with n.i (not included).

TABLE 2

Results' Multi-level Analyses with School and Classroom Variables (Model 6) and Category of School (Model 7), per Subject

	Bah. Ind. Model 6	*Bah. Ind. Model 7*	*Science Model 6*	*Science Model 7*
Grand Mean	16.0	12.3	7 6	12.8
Intelligence	13(.02)*	12(02)*	23(.02)*	22(.02)
SES	59(17)*	60(.17)*	.36(.19)*	35(19)
Location	.84(30)*	78(28)*	88(.37)*	.83(.36)
% Low SES	04(01)*	04(01)*	0.00(.01)	0.00(.01)
Exp. Staff	.03(01)	.01(.01)	n.i.	
Exp. Headmaster	n.i.	n.i.	.04(.04)	.04(04)
Sign Homework	1 8(1 0)	1 9(.94)*	n i.	
Help Homework	n.i.	n i.	n.i.	
Parental Involvement	.15(06)*	.20(05)	n.i	
Voluntary Work Parents	.48(11)*	58(.11)*	n.i.	
Exp. Teacher	.18(.03)*	.16(.03)	n.i.	
Homework	25(.17)	24(.15)	n.i.	
Innovative Teaching	2 7(06)*	3 8(.76)*	1.8(.60)*	43(.96)
Observation by Principal	10(03)*	07(02)*	n.i.	
Inti Schools	n.i	1.6(92)	n i.	2.5(1.2)
Imbas Schools	n.i	.76(64)	n.i.	1.2(.81)
Var. Pupil Level	56%	56%	64%	64%
Var. School Level	6%	4%	12%	11%
Tot. Var. Unexplained	62%	60%	76%	75%
Diff. Model Fit	4097.68**	4087.13**	4302 24(ns)	4298.05(ns)

* p, .05, ** p,.01

Starting with Bahasa Indonesia, the results of Model 6 show that after taking into account pupil and school-context variables as well the implementation variables, the unexplained variance at school level has reduced to 6 percent. This is 14% less than in the former model with pupil and context variables and category of school (see Table 2). All implementation, with the exception of the frequency of homework and signing homework by parents, are significant. The effects of the experience of the teaching staff and of the teacher of Grade 6 are negative The effects of voluntary work by parents is rather strong and positive. However, there are no effects of parental involvement with homework and even a negative effect of parental involvement in educational matters. We will come back to these negative effects in the conclusions. The results of Model 7 show that if taking into account Category of School again the unexplained variance at school level is reduced with another two percent. The model fit has improved also significantly. But a look at the regression coefficients of Inti and Imbas schools shows that the effects of both categories are not significant

In Model 6, for science only the variable 'innovative teaching' has a significant positive effect. The unexplained variance at school level is higher compared to the former model (see Table 3) and the model fit has not improved. Category of school to the model reduces the unexplained variance at school level but does not improve the model fit significantly. The effect of innovative teaching is not significant any more and, again, there is a significant positive effect of Inti schools.

So we have to conclude that the effects of community participation on student achievement are small in comparison with the effects of variables measuring the implementation of other PEQIP inputs. Student achievement especially seems to be related to the quality of teaching in the classrooms

The Cost-effectiveness of Community Participation

To answer the research question about the cost-effectiveness of community participation in comparison with the cost-effectiveness of other improvement measures, first the unit costs of community participation and of the other inputs were computed. The total costs per year made by PEQIP for each component in Sulawesi Utara were divided by the number of pupils in this province that were involved in PEQIP. Next, the cost-effectiveness ratios of relative cost-effectiveness of community participation in comparison with the cost-effectiveness of the other components can be established The comparisons were made only for the cost-effectiveness in Sulawesi Utara and only for Bahasa Indonesia and science

Table 3 shows the results for Bahasa Indonesia: the Beta weights which indicate the effect-size of each variable, the sum of the Beta weights per component (indicating the effect size of the component), the unit costs for each component and the cost-effectiveness for each component.

TABLE 3

Effect Sizes, Unit Costs of Inputs and Cost-effectiveness Ratio's for Test Scores for Bahasa Indonesia (unit costs Rp. X 1000)

Inputs	*Unit Costs per Student*	*Effect Size*	*Cost Effectiveness Ratio*
Community Participation		.33	
Parental Involvement	4	– 15	082
Voluntary Work		48	
Teacher Professional Development		2.9	
Homework	67	.25	.043
Quality of Teaching		2.7	
Evaluation and Monitoring	20	.10	
Observations by Principal		.10	.0050

The table shows that community participation is the most cost-effective component for Bahasa Indonesia. Every Rp. 10.000 spent increases the achievement with 8/10 of a standard deviation. The cost-effectiveness of the Teacher Professional Development component is, although this is the most effective component as appeared from earlier analyses, much lower. Every Rp. 10 000 spent increases the achievement with 4/10 of a standard deviation. The cost-effectiveness of Evaluation and Monitoring is the lowest, every Rp. 10.000 spent on this component increases the achievement with only 5/100 of a standard deviation.

For science only innovative teaching contributed to achievement. This variable belongs to the Teacher Professional Development component. The regression coefficient of this variable is 1.8. The cost-effectiveness ratio is .026 Every Rp. 10.000 spent on this component produces a substantial increase of about one quarter of a standard deviation in science achievement. This is less than the cost-effectiveness of this component for Bahasa Indonesia.

Summarizing the results, we have to conclude that the cost-effectiveness of community participation is high in comparison with the cost-effectiveness of other quality improvement measures.

Conclusions and Discussion

Explaining the effects of PEQIP in Sulawesi Utara with variables indicating the implementation of community participation and of the other components shows that community participation only predicts the achievements in Bahasa Indonesia. The amount of voluntary work conducted by parents had a positive effect on student achievement. This variable can be considered as a contribution of local resources to the school and as an indicator of the responsibilities of the parents to support and reinforce the education of their children. From community participation, however, negative effects are also apparent, like involvement of parents in educational matters and signing homework by parents. These findings support the idea that community participation is an important concept to take into account in theoretical models of educational effectiveness in developing countries (Lockheed & Levin, 1993). However, more research is needed to establish which variations of community participation are effective and which are not.

Comparing the effects of community participation with the effects of the other components shows that the relative effects are rather low. The effects of the Teacher Professional Development component, indicated by innovative teaching, is the strongest. This is a variable at classroom level and refers to grouping of pupils, using a variety of teaching methods, asking comprehensive questions to pupils, stimulating interaction between pupils and keeping pupils actively involved during the lessons. This finding clearly supports the assumption of educational-effectiveness-models that variables at classroom level are not only relevant in Western countries but in development countries also.

Looking from a cost-effectiveness point of view, however, one has to take into consideration that the improvement of the quality of instruction in classrooms by training teachers is a very expensive improvement measure, although it is an effective one. Community participation is, although its effects are much smaller, more cost-effective.

So it is certainly worthwhile to take community participation into account as a useful initiative to improve the quality of education in developing countries. Not only from a cost-effectiveness point of view is community participation important. Community participation also will be important when education becomes more decentralized and the community is held more responsible for the quality of the school careers of children. This is the reason why we end this paper with some recommendations for improving community participation in schools such that probably larger effects may be produced in the future. We have to keep in mind, however, that the ceiling effects of community participation will occur. Once community participation is established well in schools and the community together with the school is accountable for the school careers of children, a higher degree of community participation will not produce still higher effects. The recommendations are the most suitable for situations where community participation is not established yet or where it functions insufficiently.

Our study sometimes shows that strong parental involvement does not automatically lead to positive effects on student achievement, and sometimes even is a feature of poor-performing schools. Generally speaking, it is especially important that parents and the community support schools to prevent student absence and to motivate students to learn, to do their homework and to use their time efficiently. It is not so much the amount and frequency of involvement which is important but the type of involvement. Parents who want to be effectively involved in education may perform the following activities: they may help their children to do their homework; they reinforce their children to read books; they may improve their children's attitude towards school; they may prevent absence and send their children to school on a daily basis; they may offer help to the school to obtain financial and material resources; they may help to maintain an orderly school climate; they may support the school in its policies. We recommend making contracts between schools and community in which parents agree to support the school and their children and the school agrees to deliver high achievements. Part of such contracts may also be that schools give parents advice and support in raising their children.

All these aspects of community participation might be included in the training for parents and community leaders, but they should certainly be a part of the management training for principals because taking care of effective community participation is a major management task for the principals. Including these aspects does not have to cost more money. It is not necessary to increase the frequency and intensity of the training or to produce more materials. Only a change of content is recommended to enlarge the effects of community participation and, if the costs remain the same, the cost-effectiveness also

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ANNEXURE 1

Variables Selected for Multi level Analyses

Community Participation

- regulations with parents about homework
- voluntary work of parents
- educational involvement of parents
- help with homework
- signing homework
- financial contribution

Teacher Professional Development

- frequency of homework
- time spent on subject (Bah. Ind. Maths, Science)
- time spent on presentation of content
- time spent on work by pupils
- time spent other activities
- percentage of active learning time by pupils
- quality of instruction
- quality of classroom management
- innovative teaching
- frequency of testing
- use of test results
- kind of questions put to pupils
- grouping of pupils

Educational Management

- regulations with respect to pupils' absence

Evaluation and Monitoring

- observations in classrooms by principal
- use of test results for evaluation of teachers
- use of test results for evaluation of the quality of the school

Books and Learning Materials

- availability of equipment
- availability of student books

23

COMBATING SCHOOL DYSFUNCTIONALITY THROUGH COMMUNITY MOBILIZATION : CASE STUDY OF A RURAL SCHOOL

N.M. Rao

The study highlights the importance of community participation in enhancing school effectiveness by motivating the youths of the village. The study reports the rise and fall of a village school in the State of Karnataka and the efforts of the village population, particularly the youth, in combating the dysfunctionality of the school. The study suggests that an indifferent and apathetic community could be mobilized towards constructive educational actions by its own youth as agents of improvement.

Background

There is a saying in Sanskrit "Yatha Lokaaha, Thathaa Shikshana Kramaaha" — 'As the people are, so is the education system' If the community is indifferent towards its teacher, its school and the education system, it has no reason to expect its children to get good education. If people want their children to be educated properly, they should be willing and ready to put in their own efforts towards the all-round development of the education system, beginning with their immediate neighbourhood.

The aim of education is , essentially, to empower the learners and to aid in their wholesome development as persons and citizens. Accordingly, the teacher, who is the kingpin in this enterprise, has to be a clear-thinking and inspiring personality with an honest and sincere commitment towards his duties, Such teachers do not just 'happen'. The society has to exert itself towards the creation of an environment that attracts good teachers. Like the people getting 'the government they deserve', the society also gets the teacher it deserves In particular, the community, especially in rural, remote areas with poor infrastructure, may have to accept responsibility for looking after the living needs of the teacher (food and shelter) as well as the basic needs of the school (space, building and furniture). Creation of such a climate of "owing" the teacher and the school on the part of the community would pave the way for the teacher to give his best to the young and olds of the community-knowledge to the children of the village and practical advice to the elders to deal with daily life problems. In this scenario, community participation and school effectiveness go hand in hand, mutually reinforcing each other.

It is against this background that the foregoing study of the 'ups and downs' in the life of a rural school was taken up. With reference to the internal and external conditions under which it had to function, this school is not much different from any other school of its type in India. The difference lay in the transformation it went through. The school, which had become completely dysfunctional mainly due to the teacher factor, was not only put back on the track but also later developed into a 'model' school by the same community that remained apathetic and indifferent to the problems of the school in the beginning. The socio-cultural and educational factors which accounted for the people evincing interest in and actively involving themselves in the developmental activities of the school may apply as well to other schools in comparable situations.

Objectives of the Study

The specific objectives of the case study are:

- To highlight the importance of community participation in enhancing school effectiveness
- To show how the dormant youth can be motivated towards mobilizing the entire community towards improvement of the school and life in the community.
- To shed light on the threat of cultural alienation that looms large on the village population in the process of education.
- To show that it is possible to improve the education system in the villages within the framework of economic constraints and human resources available within the village.

Methodology

The methodology adopted for the study is essentially qualitative involving discussions and interviews with various stake holders, and on-site observations of educational and community activities. The author hails from this area and visits this village quite often The observations of the author made over a period of several years and the consultations and discussions held from time to time with the community members, parents, children, young and energetic social workers, officials and teachers, constitute the main source of data for the study.

The School

The school, called the Government Lower Primary School, the subject of this study, is the only school of Devarahalli, a remote village located below the Western Ghats, in Sullia taluk of South Kanara District, Karnataka State. The villages in this hilly, evergreen forest area are not like the villages of the plains. The houses, which are situated in their own farmland, are scattered and there may not be a house within the vicinity of another house. Most of the people of the village are lower-middle-class farmers, growing arecanut, coconut, banana, cardamom,pepper, etc. The children will have to walk about one to three kilometers to reach the nearest school. During the monsoon, it rains heavily and if the rivers are flooded, then neither the children nor the teacher can come to the school easily.

Early Functioning

The Devarahalli school, a government-aided school, started in a cowshed with about fifteen children and an untrained teacher around 1958. After two years, the school got a two-roomed tiled building and a trained teacher. Then the school was taken over by the government. For about fifteen years, the school continued as a single-teacher school for four classes, with about 30-40 children. It was neither a very good school, nor a bad school.

The Slide

Things did not continue the same way for long. The school being a government-set-up institution, the teacher got transferred to some other school and a new teacher was posted. This marked the beginning of the decline of the school. The new teacher used to be absent from the school quite often for several days, without intimation. He used to beat the students very badly. He had all the bad habits, which a school teacher should not have. Most of the parents took away their children from the school; some children were made to discontinue their education, some joined other schools far away from their homes.Hardly the names of ten students were left in the school register The school building, through disuse, eventually became a 'haunted house'.

Early Efforts

Some parents, who were interested in the education of their children, but could not afford to send them to far-off schools, had made some efforts to change the teacher. The found that the teacher had some connections at the higher levels and hence they abandoned their efforts and the school continued to be dysfunctional.

Involvement of the Youth

The village also had among its community, a band of energetic and idealistic youth, who were attracted by the ideals of Mahatma Gandhi, Chatrapathi Shivaji and Subhas Chandra Bose. They used to meet in the school grounds to play Kabaddi in the evenings. It was at this point that the author intervened to focus the attention of this 'reservoir of energy' on launching the developmental work towards the improvement of the school.

Initial Reactions

The initial reactions of the youth to the author's suggestions were not quite good. They were not hopeful. They thought that either the elders or the government had to do this job. They did not have the confidence in their own capacities to change things The author had to convince them that.

1. if they need not send their children to far off places for education,
2. they could produce more patriotic people by giving better education.
3. they could improve the village life by improving the school itself.

VEC formed

The youth called the meeting of the elders on a certain day in the school to plan for the improvement of the school. But nobody turned up! So, they organized a 'Samuhika Bhajan', invited all the villagers and put forward their proposals in that programme The youth persuaded the villagers to take up the developmental work of the school The parents who had school going children accepted this idea first The parents whose children were to come to the school in the subsequent years, joined them later. At last, the Village Education Committee (VEC) was formed, with an elderly man as Chairman and a youth as Secretary

The VEC Acts

The problem that glared the VEC in its face was the errant teacher, and the VEC decided to tackle this 'head on'. The VEC members met the teacher, and asked him to change his habits. They kept a watch on his movements. At last, when they found that the habits of the teacher couldn't be changed, they decided to get the teacher transferred. The VEC contacted the higher officials and requested them to transfer the unwanted teacher. Through a series of manoeuvres like writing letters and applications, using 'political influence', etc , they finally managed to get the unwanted teacher transferred from that school A single lady teacher was appointed in that place. The village heaved a sigh of relief !

The Problems of the School

Initially, the new teacher and the VEC had to face a lot of problems:

1. The roof of the school building was leaking and the building was dilapidated.
2. The school surroundings were very unclean and shrubs had grown all around.
3. The student strength was very little and the school become unviable
4. There were four classes to be managed by a single teacher.

The developmental work of the school building and the clearing of the surroundings was undertaken by the VEC as the villagers agreed to do the 'shramadaan'. Thus most of the problems were solved. When the others came to know that the school was improving, all the students who had discontinued their education in that school started coming back to the school This created a new problem, the school strength was increasing and a single teacher had to handle all the four classes having about fifteen children in each class.

Mobilizing Local Resources

Teachers

Very soon, the community realized that multigrade teaching is only an expedient and that it is better to appoint more teachers instead of a single teacher struggling to meet all the four classes. Therefore, the VEC made some local appointments on nominal payment. The motivations of those who came forward to take up this work differed. Some local persons who had discontinued their education after completing high school, thought that:

1. they may get a regular schoolteachers' post if they did some free service for a few years,
2. they will get some teaching experience, which will help them in future appointments;

So they came forward to become teachers in this school on nominal payment.

Finance

Lack of money was another problem before the VEC. The VEC collected some money through the Samuhika Bhajans for the day-to-day maintenance of the school and the salary of the voluntary teachers. When such collections were insufficient, the VEC asked for contributions from the parents whose children were studying in the different classes.

Starting of Shishu Mandir

The VEC found the necessity of having a Shishu Mandir near the school due to the following reasons—

The villagers thought that·

1. some informal school experience was needed for the children before they entered the regular school.
2. the villagers needed a place to leave the small children at when they went to do the farm work
3. the villagers were attracted by the K G. classes which were running in the cities.

At that time, a celebrated Swamiji, who is also a social reformer, advised them to start a Shishu Mandir which would give the initial training to the children in all the good habits of life With the success the VEC got in developing the government school, they started an Anganwadi (called Keshava Shishu Mandir) near the government school in a separate thatched hut They were able to get a teacher who had been trained for about 2 months in preschool education, and hence had imbibed the qualities of a good teacher

Character Building

The Anganwadi teacher, who was trained by an able social worker, could show improvements in the school by her deeds. The children were taught to say their prayers at home; respect the elders, wash their clothes themselves, take bath and keep themselves clean, sing bhajans, etc. Also, she helped the government school during her free hours. The prayers, yoga, exercises, cleanliness, punctuality, etc., became the common activities of the Anganwadi as well as the government school.

Progress of the School

In the morning, before the school bell rings, both the teachers and the children take part in cleaning the school (both inside the building and outside). The school starts with a prayer The children, teachers and the parents take part in all the developmental programmes like planting trees around the school, fencing them, developing the playground, etc

Some villagers who have some special skills like bee-keeping, planting trees, basket-making, cane-work, carpentry, etc. come to the school and demonstrate these skills to the children Earlier, nobody had asked these skilled persons to give demonstrations to the children. Now the VEC is coordinating all these activities and has made these demonstrations possible The night 'Samuhika Bhajan' programme is the one place where the VEC discusses all the developmental programmes of the school.

The government, after seeing the progress of the school, has upgraded this school as a higher primary school. Two more regular teachers have been appointed But the school with seven classes cannot be managed by three teachers. Therefore, the procedure of appointing locally trained/untrained teachers as volunteers, by the VEC, continues The interest in improving the school is very much there with the teachers, parents and the children. The parents have understood that their children can get good education in their own village provided they improve their school. The teachers think that the whole village is watching their work and gives them all the support need in their activities.

The Future Ahead

The VEC wishes to continue their efforts for the progress of this school. But they may not expand it further to make it into a high school because they do not see the necessity of it. They have the fear that the present teachers may be transferred to some other place and some uncooperative teachers may be posted here. They also fear that the government may interfere in the freedom and may not permit them to appoint local persons as teachers on nominal payments. But they also feel that education without moral values is of no use. Hence they require teachers who are morally very sound. They believe in what Mahatma Gandhi said: " These truths cannot be taught through words or through books - the children can learn these truths only through the daily life of the teacher. If the teacher himself lives up to the tenets of truth and justice, then alone can the children learn that Truth and Justice are the basis of all religions."

Conclusion

The rise of the Devarahalli school from a state of hopelessness to one of hope and optimism illustrate how an apathetic and indifferent community could be mobilized into a dynamic, change-seeking and action-oriented one through the catalytic intervention of its own youth. Of the many lessons that can be drawn from this story the following may be mentioned. suitably motivated, the idealistic, energetic youth of the community will come forward to accept responsibility for the problems of the community and guide the people towards self reliance; the responsibility of managing the schools best given to the people themselves; parents should be made to actively involve themselves in the planning and implementation of various activities aimed at enhancing school effectiveness; adding the non-formal components like value-based education, vocational training, community service, environmental consciousness, etc., will greatly enhance the quality of learning of the children in the formal system.

24

COMMUNITY PARTICIPATION IN PRIMARY EDUCATION AND SCHOOL EFFECTIVENESS

Satender Kumar : Ramesh C. Patel : Anjali K. Mehta

The study examined the contribution of the community in the primary schools of Vadodara in terms of their establishment, finance and management. It also studied the association of community participation with school effectiveness. The author suggests that formation of PTAs in the schools should be initiated and committed persons from the community, who could work as resource persons, be identified and invited to deliver talks to the primary school teachers This would be helpful in enhancing the professional growth of teachers. The problem of absenteeism could be reduced to a large extent through community participation.

Introduction

In the present-day world, it is education that determines the level of prosperity and welfare of the people. It is for this reason that in the constitution of India provision is made for free and compulsory education. Article 45 states that, "The state shall endeavour to provide within a period of ten years from the commencement of this constitution for free and compulsory education for all children until they complete the age of 14 years." Since 1950, determined efforts have been made towards the achievement of this goal. However, universalisation of elementary education in its totality is still an ellusive goal.

The State of Gujarat also has made sincere efforts to provide primary education to all. The literacy rate has increased from 36.19 in 1961 to 61.29 in 1991 However, in comparison to the national literacy rate, which was 52.19 in the year 1991, it is little higher It is worth mentioning here that in Gujarat, before independence some of the princely states were even more progressive than the British Provinces and made a start in compulsory education long before any of the British Provinces thought about it. Maharaja Sayajirao of Baroda, for instance started an experiment in compulsory education as early as 1892-93 in Amreli and the surrounding nine villages. His Highness Sayajirao Gaikwad III of Baroda had tremendous faith in education as a means of renewing the intellectual and material vitality of the country and introduced compulsory primary education in the State as early as 1906. However, the universalisation of education has not been possible even in the district of Baroda. The literacy rate in the year 1991 came to 63 61, which indicates that much remains to be done. The main reasons for not going to school or dropping out from school are illiteracy and attitude, lack of activity-based teaching methods and education's irrelevance to the community. However, efforts have been made to provide education to all and to maintain the quality of education In this regard, the city of Baroda has emerged to be an effective centre of education, not only in the State, but in the whole country. Baroda has been a progressive city with reference to industrialization, education, culture and architecture. Baroda's population in the year 1991 was 10,31,346, and the projected figure for the year 2001 is 18,40.371 and the rate of growth is 56.79. It may be mentioned that 17.20 per cent growth is natural, and the 39.59 per cent growth in population is due to migration which takes place due to job opportunities here. In such conditions, how a city maintains quality education and how the community participates in the education endeavour is an issue worth studying.

Rationale of the Study

In order to enhance the standard of living of the people, their economic and social development is essential. This indicates that education must be relevant to the community. If this is to be done, then community participation in the educational system will be necessary. It is more so at the primary level, where all learning has to be concretized more meaningfully with the help of work situations existing in the immediate community and environment. Community participation is needed even to bring first-generation learners to the school. Even to ensure regular attendance of children in the school and to guide educational activities of children out school will require community involvement. In order to maintain the quality of school education at primary level, community involvement in school management and other activities appears to be inevitable.

Educationists have already realized the importance of the community in the educational endeavour and conscious efforts in this direction have been made. At all-India level, the UNICEF-assisted project, viz., "Development Activities in Community Education and Participation", was undertaken in the year 1975 The project aimed at increasing participation of the community in formal and non-formal education and at raising the general level of literacy In the year 1979 another project, "Comprehensive Access to Primary Education" (CAPE) was undertaken, which had one of its components aiming at community participation, and that was involvement of Development Agencies in the Community The National Policy on Education, Programme of Action (1986) stated that, "The planning would be decentralized and the teachers as well as local community fully involved in the process." Even in "Teacher Education Curriculum — A Framework" prepared by the National Council of Teacher Education (NCTE) in 1979, community participation was given due emphasis by adding a component, "Working with the Community". All these efforts indicate the desire of educationists to have community participation in the field of education But the question arises to what extent community participation is there in our primary education Do schools involve the community in their management and in planning and organizing school activities? In what form, is community participation obtained by the schools? In what way do the schools obtain the community participation? Does school effectiveness have some relation to community participation? It would also be interesting to study how voluntary agencies in the community are participating in the educational endeavour in Baroda. Answers to such questions can be obtained when some scientific study is undertaken However, the investigators could not trace any study providing answers to the above questions. In view of this, the present investigation has been undertaken to respond to some of the questions stated earlier.

Statement of the Problem

Considering the nature of investigation, the problem is stated as follows: "Community Participation in Primary Education and School Effectiveness."

Objectives of the Study

The present investigation aims at studying the community participation in primary education and school effectiveness in the city of Baroda. The specific objectives are stated as follows.

1 To study the contribution of the community in the primary schools of Baroda in terms of their (i) establishment, and (ii) finance.

2. To study the community participation in the management of primary schools in terms of (i) The School Management Committee and its functioning, and (ii) The Parent Teacher Association (PTA) and its functioning.
3 To study the procedure of obtaining community participation in school.
4. To study the contribution of voluntary organisations in the community in primary education in the city of Baroda.
5. To study school effectiveness and its association with the community participation in the school.

Research Methodology

In order to achieve the objectives of the present investigation a survey was undertaken. The methodological details like sample, sources of data, tools, procedure of data collection, and analysis of data are given below.

Sample

For studying the contribution of the community in the primary education in terms of establishment of schools and finance, all the 372 schools offering primary education in the city of Baroda were taken into consideration. In order to study the community participation in school management and school effectiveness , 50 schools were selected through stratified random sampling. The details of these 50 schools are given in Table 1.

TABLE 1

Number of Sampled Schools in Different Categories

S.No.	*Category of Schools*	*No. of Selected Schools*
1	Private Aided Schools	04
2	Private Unaided Schools	26
3	Baroda Municipal Corp. Managed Schools	18
4	Central Schools	01
5	Schools Following CBSE Syllabus	01
	Total	50

In order to study the contribution of voluntary organisations in the community towards primary education, data were obtained from 176 voluntary organisations In addition to this, one administrative officer of the Nagar Prathmik Shikshan Samiti and 5 trustees of different schools were also interviewed to know about their participation in school activities.

Sources of Data

The main sources of data were the school records, trust constitutions, survey report of the United Ways of Baroda, principals of primary schools of Baroda, official records from the office of the Education Officer of Baroda District and Official records from the office of the Nagar Prathmik Shikshan Samiti

Tools

A questionnaire was developed for the principals of different schools to collect data with respect to community participation in school management and school effectiveness. The developed questionnaire was given to an expert and modified as per his suggestions The modified version was tried out in 4 schools and further modified on the basis of the field experience. In addition to this, a semi-structured interview schedule was developed for the administrative officer and trustees of the school management board based on the following aspects

- their involvement in the functioning of the school,
- their perception and vision about of school improvement.

Data Collection

The data regarding types of schools in Baroda were obtained personally by the investigators from different sources, viz , District Education Officer's office, Nagar Prathamik Shikshan Samiti, and Central Schools. The questionnaire was given to the school principals personally by the investigators. The information related to Std. V attendance and results in certain cases were provided by the school principals in the questionnaire itself, but in most cases the attendance register and results were provided by the school principal and the investigators obtained the required information from original records. The Administrative Officer of the Nagar Prathamik Shikshan Samiti and trustees were interviewed by the investigators personally. The data regarding voluntary organisations in the community contributing towards education were obtained from "A source book for social planners", donors and functionaries of human service organization, titled, Voluntary Scene in Vadodara.

Data Analysis

The data related to community participation were analysed qualitatively; however, frequencies and percentages were calculated wherever required The data related to school effectiveness were analysed quantitatively, the details of which are presented below School effectiveness was based on five indicators having differential weightage, which are presented in Table 2.

TABLE 2

Weightage to School Effectiveness Indicators

S.No	*School Effectiveness Indicators*	*Weightage*
1	Planning & implementation of curricular and co-curricular activities	10
2	Average attendance of Students	10
3	Participation in sports & other competitive events	20
4	Academic performance of students	50
5	Building and maintenance	10
	Total	100

Out of five indicators, the data related to indicators 1,3 and 5 were rated on a five-point scale ranging from Very Good to Poor as shown in Table 3.

TABLE 3

Weightage to Different Scale Points

Scale	*Very Good*	*Good*	*Average*	*Below Average*	*Poor*
Scale Point	05	04	03	02	01

The score for a particular indicator was arrived at by multiplying the rated scale point with an appropriate number. For instance, if a school is rated average for planning, its score will be 3 x 2 = 6, But if the same school is rated average for its participation in sports, its score will be 3 x 4 = 12.

The data related to attendance of students were converted into average percentages. This range of percentages was divided into three categories and marks were fixed for each category as shown in Table 4.

TABLE 4

Percentage of Average Attendance and Marks Allotment

S. No	*Percentage of Attendance*	*Marks Allotted out of 10*
1	90 and above	10
2	70 to 89	07
3	50 to 69	05

The data related to academic achievement of Std V students were also converted into average performance in terms of percentage of marks. Average performance was divided into 05 categories and marks for each category were allotted out of 50 which is weightage for academic performance as shown in Table 5.

TABLE 5

Percentage of Average Academic Performance and Marks Allotment

S. No.	*Percentage of Average Academic Performance*	*Marks Allotted out of 50*
1	23 to 30	10
2	31 to 37	20
3	38 to 45	30
4	46 to 53	40
5	54 to 60	50

Thus each school, in whichever category it may come, will get the marks accordingly.

It may be observed through this process of data analysis of the school effectiveness component that, a school will have marks for five components separately. The final score for school effectiveness was arrived at through addition of marks on all the five indicators.

The data related to the contribution of voluntary organisations in the community were content-analysed and their contributions in different spheres of primary education were delineated.

Major Findings

In order to study community participation in primary education, the participation was studied in different spheres of primary education and data were analysed accordingly The main spheres of findings are presented under different heads, viz., community participation in school establishment, finance, management, and school effectiveness, and the contribution of voluntary organisations.

Community Participation

The findings related to community participation in terms of school establishment, finance and management are described below.

School Establishment

It was found that in Baroda city there are 372 primary schools, of which 56.44% schools are managed by the community, that is by private trusts without any financial aid from the government whereas 06.45% schools are managed by the community with financial aid from the government. The remaining 37.09% schools are managed by the Baroda Municipal Corporation and the Kendriya Vidyalaya Sangathan. The details are given in Table 6.

TABLE 6

Number of Schools Under Different Establishments

S.No.	*Category of Schools*	*Number of Schools*	*Percentage*
1	Private Aided Schools	024	06.45
2	Private Unaided Schools	208	55.91
3	Baroda Municipal Corporation managed Schools	134	36.02
4	Central Schools	004	01.07
5	Schools Following CBSE Syllabus	002	00.54
	Total	372	100

School Finance

With respect to school finance it was found that, the community participation was to a differential extent. The details are given in Table 7.

From Table 7, it can be observed that even in private-aided and BMC-managed schools the community has contributed in terms of financial support. These data were further analysed to find out the share of the Central Government, the State Government and community in the financing of the schools.

TABLE 7

Community and Government Contribution Towards Finance of School

S No.	Establishment of Schools	No. of Schools	Percentage of Financial Aid by	
			Government	Community
1	Private Aided Schools	24	85	15
2	Private Unaided Schools	208	00	100
3	Baroda Municipal Corporation managed Schools	134	85	15
4	Central Schools	4	100	00
5	Schools Following CBSE Syllabus	2	00	100

It may be observed that the community has the largest share in the financing of schools in Baroda.

School Management

The data related to community participation revealed the following:

(i) Mode of Obtaining Community Participation

With respect to mode of obtaining community participation, it was found that the Principals obtained participation through the following modes:

- by calling meetings,
- by sending written communication,
- through personal efforts

(ii) The School Management Committee

With respect to community participation in the School Management Committee, two aspects were studied the functions of the committee and its formation.

Functions

As far as the functions of the management committees are concerned; the members took part in staff selection, resource mobilization, and attended various functions organized by the school. In certain schools it was found that the committee members were also involved in the planning and organisation of school activities In addition to these function, the committee members were involved in purchase and construction and maintenance of the school building

Formation of Management Committee

In the formation of the Management Committee a great deal of variations were observed which is described in below with respect to different types of schools.

1. *Central School :* In the case of Central Schools it was found that, the School Management Committee consisted of about 13 members. It was mandatory to involve the community in the School Management Committee. The chairman of the Vidyalaya Management Committee is the Head of the Project and he has one member as his nominee. There are two eminent educationists, one member from the field of culture, two parents' representatives, one medical member, one SC/ST representative, one teachers' representative, one co-opted member, and the chairman of the Central Government Employees Welfare Committee, and the Member-Secretary is the Principal of the concerned school. However, it is worthy to report that the Vidyalaya Management Committee is formed without any politicization or elections, and functions quite effectively.

2. *Schools Following CBSE Syllabus :* In Baroda there are two schools which follow the CBSE syllabus; one of these is Bhartiya Vidya Bhavan's Vallabharam Mehta Public School which was in the sample In the Management Committee of this school, it was found that there is a Central Management Committee of all the schools of Bhartiya Vidya Bhavan which has more than 60 schools all over India. The Director of the school is representative of the Managing Committee and he remains overall incharge for all the activities. There is a Central Managing Committee (ACADEMIC) which mainly involves members from the trust. The Committee members are devoted completely to the school activities on a whole-time basis.

3. *Private Aided and Unaided Schools :* In these schools, the community members had formed a trust and members in the School Management Committee were nominated from amongst the trustees. Nowhere were elections held for this purpose. However, the involvement of the members was found to be different in different schools.

It may be mentioned here that in this category Missionary Schools had a somewhat different procedure for forming the School Management Committee. It was found that the school Management Committee was constituted of 10 members mostly. It is the Gujarat

Regional Conference (GRC) which chooses the members according to their educational qualifications and their involvement in educational activities. It was also found that for certain positions elections were contested with keen interest. The Principal of the school was one of the members of the School Management Committee

4. *Schools Managed by Baroda Municipal Corporation (BMC)* There are 134 primary schools managed by the BMC. In order to involve the community in the management of these schools, the BMC forms a committee called the Nagar Prathamik Shikshan Samiti (NPSS) or Municipal School Board. The NPSS is constituted of 15 members who are nominated by the ruling party of the BMC. These members are from the community, representing the entire Baroda city.

Parent Teacher Association (PTA)

With respect to community participation in the form of PTA, it was found that, the schools managed by the BMC did not form the PTA. In the remaining schools it was found that 50% of the schools in Baroda had formed PTA till January 1998.

The members of the PTA usually participated in the activities like celebrations of national days, sports day, and result-declaration day for discussing the academic achievement of their ward.

However, in some of the progressive schools the members of the PTA participated in teaching school subjects in the absence of the regular teacher, helped in craft and knitting work, etc., helped in conducting computer classes and providing transport facilities for picnics. In one of the schools the members of the PTA even presented a cultural programme. It is also worth mentioning that some of the members of the PTA sponsored a few activities of the school like school magazine, sports, etc.

It may also be noted that most of the schools which did not form a PTA were calling a meeting of parents once in a year. In the case of BMC managed schools, and the schools which were located in the backward areas of the city, the parents' meeting discussed the problems of absenteeism of their wards and issues related to school.

Voluntary Organisations

Regarding community participation in the form of a voluntary organisation it was found, that, out of 504 voluntary organisations working in Baroda, 176 were contributing towards education, of these, 160 were working for primary education. These voluntary organisations contributed in different ways towards educational development, the details of which are given in Table 8.

TABLE 8

Number of Voluntary Organisations and Type of Contribution Provided to Primary Education

S.No.	Type of Contribution	Number
1	Financial help	19
2	Educational services	81
3	Educational and economical help	16
4	Social and educational development	12
5	Educational and recreational services	06
6	Educational and cultural development	10
7	Educational and spiritual development	01
8	Educational and welfare activities	01
9	Non-formal education	01
10	Recreational services	01
11	Education to physically handicapped	03
12	Social, educational, Cultural economical and health	01
13	Educational and medical	01
14	Hostel	06
15	Providing transport for visiting historical places, study of environment, etc	01
	Total	**160**

In addition to the details given in Table 8, a close look at the voluntary organisations data also revealed that the caste factor still plays a very vital role in the Indian society. It was found that, in the case of financial help, scholarship and hostel facilities, voluntary organisations of a particular community provided these facilities only to their own community's students. For example, Kshatriya Samaj helped students from the Kshatriya community and Dhobi Panch helped students from the Dhobi community, and so on.

Community Participation in Relation to School Effectiveness

In order to study the relationship between community participation and school effectiveness, the data related to both aspects were quantified. Community participation included four components, viz., the criteria for forming School Management Committee and educational qualification of its members, involvement of its members', in school activities, non-members involvement in the school activities, and PTA or involvement of parents All the four components were given equal weightage, and a community-participation score was arrived at

For school effectiveness, five components were taken into consideration. These were

- planning and implementation of curricular and co-curricular activities
- regularity of students in terms of their average attendance,
- participation of students in sports and other competitive events,
- academic performance of the students of Std V,
- building and maintenance

Based on all the five components a composite score was arrived at

The results revealed that there is a positive relationship between community participation and school effectiveness. The co-efficient of correlationship between the community participation and the school effectiveness was found to be 0.898. This shows that, greater the community participation in a school, the greater is the effectiveness of a school.

In addition to these statistical results, there was another factor which affected the community participation in the school. This was the catchment area of the school which decided the social, educational, and economic status of the community being served by the school. It was observed that the schools catering to the higher strata of the society could achieve greater community participation whereas schools catering to lower strata of the society could not achieve the same in the school activities. There, even the resources and ability to participate in the school activities were also lacking

Implications of the Present Study for Improving Primary Education

A piece of research can be considered effective only when the fund of knowledge generated through it can be applied to improve the existing practices of education This study reveals that community participation enhances school effectiveness. Community involvement develops a sense of belongingness which leads the community to take up responsibilities related to school activities on their own shoulders. It was also found that the social, economic and educational status of the community in the catchment area affects the community participation in the school. Therefore, it is advisable to initiate forming PTAs in the schools and to identify the committed persons from the community who can work as resource persons for the school Similarly, community members who have expertise in teacher education, child development, etc., can be invited to deliver talks to the primary school teachers which will enhance their professional growth. This effort will make the school functionaries more serious in their own work and provide help to them in need which will certainly improve the school's functioning.

It may also be noted that schools having the problem of absenteeism and first-generation learners can reduce this problem to a large extent through community involvement. As we know, that a primary school child only four to five hours in the school, and for the remaining 19 to 20 hours, one is at home, and the parents' or experts' guidance at home influences children's development positively. Guided study at home and formation of the habits of doing homework regularly and with perfection is lacking in the lower strata of the society This study reveals that the PTA can do this service to the children and thereby improve the quality of education at school level.

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SECTION VIII

Management of Learning in Large-sized Classes

The studies discussed in this section include·

- Learning Organization and the Effectiveness of Primary Education in Lesotho· A Case Study of Roma Primary Schools
- Activity -Based Teaching-Learning Strategies (ABTS) in a Large-sized Class at Primary Stage A Study
- Teaching Environmental Studies in Large-sized Primary Classes. Evaluation of Some Practices
- Instructional and Management Practices in Large-sized Classes: Reflection on Classroom Strategies

25

LEARNING ORGANIZATION AND THE EFFECTIVENESS OF PRIMARY EDUCATION IN LESOTHO: A CASE STUDY OF ROMA VALLEY PRIMARY SCHOOLS

T. Mphuthi : O.A. Adeola

The study aimed at identifying the status of primary education in Roma Primary Schools in Lesotho. The study revealed that the problems faced in the schools were due to a high teacher-pupil ratio resulting in overcrowded classrooms, lack of school infrastructure facilities and shortage of qualified teaching staff. The study suggested the application of radical and revolutionary approaches to provide long-term solutions to improve the quality of education in primary schools.

Introduction

Lesotho's education has developed remarkably since independence. Enrolment in schools has increased enormously, over-extending available resources. More than 88 percent of approximately 360,000 pupils in Lesotho are enrolled in the primary school system which is severely overcrowded and understaffed. The sixth National Development Plan 1996-97 to 1998-99 revealed that notwithstanding the increased training of teachers and improving and expanding teacher inservice programmes, the pupil-teacher ratio which stands at (55:1) has remained very high at the primary school level. The pupil/classroom ratios have also remained very high—ranging between 85 and 120 pupils to a classroom. According to the National Development Plan, this situation compromises the quality of education, resulting in high repetition and drop-out rates. The document further stated that Lesotho's education system has been suffering from serious problems of declining quality and lack of relevance to occupational and social realities. There have also been problems poor of facilities, inadequate staffing, high turnover rates, and a significant proportion of unqualified teachers in schools, resulting in high costs to government and parents The importance of quality/effective primary education cannot be overemphasized. It is the bedrock or foundation for secondary and tertiary education, and it has been revealed that failure to provide quality primary education also has serious long-term consequences for Lesotho's economic and social development. Although about 20,000 persons enter the work force each year, only about 6,000 find jobs Most of the unemployed are unable to find jobs because of their low level of skills While education is not the only factor contributing to the high unemployment levels, the failure to provide quality primary education has become a root factor in social and economic instability. (Sixth National Plan, p. 173).

The Development Plan proposed a number of strategies to address these problems. These include

1. Expanding the primary teaching force to reach a pupil-teacher ratio of 50 1,
2. Improving teacher quality through pre-service and inservice certified training,
3. Lowering teacher turnover and raising morale by improving conditions of service,
4. Increasing the average teaching load to 30 periods/week and rationalizing the number of subjects taught in each school,
5. Increasing provision of qualified teachers, through expansion of pre-service and inservice distance certification programmes (p.174).

The objectives of the study therefore were .

- to find out the nature of learning organizational problems in primary schools in the Roma Valley area of Lesotho,
- to examine the strategies that are being adopted for solving the learning organization problems confronting effective teaching and learning in primary schools;
- to discuss the implications of such strategies as well as make appropriate suggestions for improvement in teaching and learning strategies in Lesotho primary schools.

Review of Related Literature

The search for effective schools is a legitimate activity for parents and society, wherever choice is available and practicable, and wherever there is suspicion that some schools are better than others Yet academic researchers have often queried the influence of schools The work of American sociologists such as Coleman et al (1966) and Jencks et al. (1972) has been used to suggest that in comparison to the influence of the family, the effects of different schools are likely to be inconsequential. Accordingly, the research problem in most cases has been largely concerned with finding ways of comparing schools which take account of the fact that some schools receive pupils who are relatively advantaged in terms of their economic and social characteristics, whilst others receive pupils that rate the opposite. Indeed many schools in both urban and rural settings receive an intake of pupils with extremely disadvantaged background. Another research interest is in the distribution and effective use of resource materials.

A useful definition of an effective school, therefore, is one in which pupils progress further than might be expected. From a consideration of its intake and provision of school resources, whilst this definition provides the basis for conceptualising school effectiveness studies, and indeed, for designing an appropriate methodology for school comparisons, some further points concerning 'effectiveness' need to be made. First, schools can be classified as 'effective' whatever the absolute level of advantage/disadvantage of their pupil intake. Schools serving a very disadvantaged population and with poor learning resources can be highly effective. Similarly, schools serving very advantaged populations and with good learning resources can fail to be effective and can foster underachievement amongst their pupils.

Second, no school - even one that is highly effective - can guarantee progress to all its pupils. Many teachers will be familiar with the pupil who, though highly talented, appears to lack the motivation to achieve.

Third, whilst effectiveness and efficiency in some ways overlap, they do not necessarily represent the same qualities. (Mortimore 1991) With these general points about school effectiveness in mind, we shall comment on the nature of some of the work that has been carried out and on the main findings of such studies in this field

Research in England and Wales (Peter Mortimore, 1991) revealed that in England and Wales over the last two or three decades, a number of studies have addressed, indirectly, questions concerning the effectiveness of individual schools. Mortimore cites works of scholars like Bennett (1976) Bennett et al. (1984), Galton and Simon (1980), Putter (1983), and Reid et al. (1987). Of particular interest were the two major studies that addressed issues of effectiveness at the primary level, these are the Junior School Project, carried out by Mortimore et al. (1986; 1988) and by the Thomas Coram Research Unit (Tizard et al. 1988).

The Junior School Project has four aims: to produce a detailed account of the pupil and teachers and of the curriculum and organisation of inner city schools, to study the progress of the pupils as they move through four year of school, to establish whether some schools were more effective than others when the intake factors have been taken into account, and to investigate differences in the outcomes of different groups of pupils.

The Thomas Coram Study (Tizard et al 1988) had a sample of 33 infant schools. Although this sample was not randomly generated but had been deliberately constructed to include higher proportions of students from ethnic minorities, the study was able to investigate the effects of schooling on the pupils' development

Both studies used sophisticated methods of analysis including multi-level modelling, regression analysis, cluster analysis and structural-equation modelling. Both studies also adopted longitudinal designs-following pupils through a number of years of schooling. Furthermore, both attempted to find adequate statistical methods with which to compare the effects of family background and schooling.

There has been quite some research in the U.S.A The first key America study was carried out in the late 1960's by Weber (1971) He studied four (in his terms) "instructional-effective" inner city schools. These schools were chosen because the pupils' reading achievement was above average for the neghbourhood despite the intake of the school. Weber identified leadership and resource distribution, as well as high expectations and relative orderliness within the school, as being important correlates A number of studies followed this pioneering work of Weber. These include New York (1979), Madden et al. (1976), Brookover and Lezotte (1977), Frederiksen (1975); Edmonds (1982); McCormack — Larken and

Kritek (1982); Murphy et al. (1982); MREL (1990); Levine and Lezotte (1990). The majority of these works are school improvement projects.

In Lesotho, Mathot, G B.: carried out a survey of one-teacher schools and multigrade classes using 15 case studies on the logistics and administrative aspect of staff development in Lesotho in 1994. Mathot's report described 15 cases of one or two-teacher primary schools, looking at the characteristics of the locality of the schools, of their premises, facilities, organisation and effectiveness and on their support systems. Mathot's work appears to be the only one so far carried out on school effectiveness at the primary level in Lesotho.

Main Findings

There are a number of findings common to studies carried out in different countries and with different education systems. These can be listed under two headings general factors and specific factors.

Central Factors

1. *Intake* : Most of the studies have demonstrated how important it is to take account of differences in student intake when studying the effectiveness in schools.

2. *Progress* ' In general, the studies indicate that even when differences in intake have been taken into account some schools are more likely than others to lead to good outcomes. Whilst "school effects" are open to a number of different interpretations, it is clear that some schools are better able to foster progress than are others even when, in some cases, the pupil intake to the less effective schools appears more promising. (Underachievement in schools with simply good examination results had been closely documented (Mortimore and Byford, 1981)

3. *Outcomes* The questions of whether schools have uniform effects and of whether different groups of pupils stand to gain more or less from attending an effective school have less clear-cut answers. It appears that whilst some schools are more effective in fostering progress in some aspects of learning, others may be more effective in others. In terms of whether different groups of pupils gain more or less from an effective school, Mortimore et al. (1988) show that schools which are effective for one group are also likely to be effective for the others

4. *Home or School Influence* . One of the most interesting general findings of the research concerns the relative influence of home and school on pupil outcomes. As noted earlier, Coleman and Jencks' findings have been used to suggest that in comparison, to that of the home, school is likely to form only a weak influence. Both Mortimore et al. and Tizard et al. found that whilst attainment was influenced heavily by the home background, progress was more likely to be influenced by schooling.

Specific factors

1. *Leadership* The studies show that having a head-teacher who is purposeful but neither too authoritarian nor too democratic and who is able to share ownership of the school with colleagues is important.
2. *Management of Pupils* . Organising schools so that pupils are involved and can be rewarded on their efforts is important. Some of the findings also show that controlling behaviour with methods that are neither too weak nor too harsh is likely to be most effective.
3. *Management of Teachers* · Involving teachers in the corporate life of the school and pursuing consistency in their approach to pupils is likely to make the school a less stressful place for both parties. Providing a broad, balanced curriculum which recognises the academic role of schooling but also values students with special educational needs, is a difficult but crucial task. So also encouraging teachers to be good models of punctuality, politeness and consideration is also important, as is ensuring that classrooms have positive psychological climates in which pupils are encouraged to communicate frequently with their teachers
4. *Pupil Care* : Treating pupils with dignity and encouraging them to participate in the organisation of the school — even at a young age — gives a positive signal that they are valued. So also keeping systematic records of pupils progress is crucially important if the curriculum is to have coherence for individual
5. *School Environment* : Ensuring that the environment is convenient and made as attractive and stimulating as possible, through provision of adequate facilities and taking trouble over

classroom displays sound relatively simple tasks but they may have a profound effect on the attitudes of pupils attending the school. For example, it was discovered that the apparent deficiency of the one and two-teacher schools in Lesotho can be partly explained by the fact that they are found in relatively poor areas, while Mathot's study concluded that these one and two-teacher schools fulfil the need of the many small communities in the mountains of Lesotho, which is confirmed by the support the schools receive from the chief and the community. The report added that it would be difficult for young children to have to travel long distances to larger primary schools, or, even worse, to have to board during the school terms away from the support of their immediate families. Even though a lot of facilities, including classrooms, offices, desks, library textbooks, organization, etc., were found to be inadequate and deficient in these schools, Mathot's study pleaded for more support from the management committees of parents as well as collaborations between and among adjacent schools.

6. *School Climate* : Endeavoring to achieve a consensus on the values shared by the school as a whole needs to be a fundamental aim. Establishing clear rules and guidelines for pupil behaviour and maintaining high expectations for all pupils are the way in which the goals and values of the institution are translated into daily life.

Implications

- A balance of intellectually able and less able children in the school has to be maintained, since, when a preponderance of pupils in a school were likely to be unable to meet the expectations of scholastic success, poor group cultures and an anti-academic or anti-authority emphasis may have formed.
- As regards system of rewards and punishments, ample use of rewards, praise and appreciation has associated with favourable outcomes
- In the school environment, good working conditions, responsiveness to pupil needs and good care and decoration of buildings were associated with better outcomes.
- Ample opportunities for children to take responsibility and to participate in the running of their school lives appeared conducive to favourable outcomes.

- Successful schools tended to make good use of homework, to set clear academic goals and to have an atmosphere of confidence as to their pupil's capacities
- Outcomes were better where teachers provided good models of behaviour by means of good time-keeping and willingness to deal with pupil problems.
- Findings on group management in the classroom suggested the importance of preparing lessons in advance, of keeping the attention of the whole class, of unobtrusive discipline, of a focus on rewarding good behaviour and on swift action to deal with disruption.
- Outcomes were more favourable when there was a combination of firm leadership together with a decision-making process in which all teachers felt that their views were represented.

Methodology

Design

The study employed both descriptive and analytical research methods, using where possible an *ex post facto* as well as oral interviews.

Population

The populations for the study consisted of all the primary schools in Lesotho. Presently there are about 1250 primary schools in Lesotho, 164 of which are located in Maseru District. However due to limitations of funds, time and human resources, it was not possible to reach all of them. The study only focussed on five primary schools in Roma Valley area in Maseru District as a case-study

Sample

The sampling methods that were adopted for data collection included a combination of purposive, systematic random and stratified sampling techniques.

Instrument

The instrument devised for this study is a combination of :
(i) a questionnaire, (ii) interview guide, and (iii) observation.

A research instrument labelled as "Learning Organization and Primary School Effectiveness Questionnaire" (LOPEQ) was developed to collect data. After the initial construction of the instrument, it was validated with the assistance of colleagues in the university The instrument was pre-tested on a randomly selected primary school in the Roma Valley area.

Data Collection and Analysis

The researchers personally administered the instrument to the head teacher and two experienced teachers in each of the schools selected. The data were analysed using different statistical analyses such as percentages, t-test, graphs, tables.

Major Outcomes/Findings

1. The battery of learning organization problems in most primary schools in the Roma Valley area can be summarized as follows:
   (a) high teacher-pupil ratio resulting in overcrowded classrooms;
   (b) inadequate, or lack of, school building facilities including desks, playgrounds, classrooms, toilets, materials, teaching and learning aids, etc., culminating in poor teaching and poor results as epitomized by Standard 7 results which showed a decline in the rate of progress of pupils when compared to ten years back;
   (c) truancy, irregular attendance of pupils and lack of cooperation and understanding of parents in this regard hampered the school management and also contributed to the poor performance of such pupils,
   (d) shortage of qualified teaching staff;
   (e) multi-level teaching in one of the schools, which made it difficult for a class teacher to monitor the progress of his or her own class;
   (f) the attitude of most young or new teachers who receive friends daily which leads to undesirable community gossip; such teachers have no time to prepare for the next day's work;
   (g) poor performance in English Language which is the medium of communication from Standard Four in all subjects except Sesotho (National language); and

(h) irregular inspection of schools by the Ministry of Education inspectors which has led to the significant reduction in standard

2. Strategies currently being adopted by the schools to address these problems include

(a) massive use of guidance and counselling technique by the head teachers and teachers,

(b) improvision by individual teachers in making their teaching aids,

(c) syndicate meetings of head teachers with staff and community in finding solution(s) to the problems.

(d) contingency and temporary measures like renting residences or houses for classrooms and offices, employing private teachers in case of staff inadequacy, use of environment, e.g , under the trees as classrooms, etc.;

(e) motivation, or encouraging teachers and pupils to be punctual and to speak English at all times;

(f) use of parents' manpower in making token contributions which they can afford, e.g., providing supplementary books to improve English language.

(g) strict monitoring and supervision of teachers by head teachers.

(h) invitation of guest speakers, subject specialists and inter school exchanges.

3. The majority of the respondents were of the opinion that the above-listed strategies currently being adopted were effective to some extent and that the progress was slow but could be supplemented by newer and better strategies. A synopsis of such newer approaches as suggested by the respondents include.

(a) the use of the attendance card which should be endorsed by the parents and the teachers for pupils who play truant,

(b) active involvement of associations like the Parent Teacher Association in the school management;

(c) use of fund-raising activities to purchase extra materials which should be kept in schools.

(d) conducting regular workshops to help teachers in their work;

(e) adoption of team-teaching among teachers:

(f) group discussion among pupils and news-report presentation by pupils.

Implications of Findings for School Effectiveness

Each of the eight major problems highlighted by the respondents has a lot of implications for school effectiveness. Some of such implications include:

1. The high teacher — pupils ratio results in overcrowded classrooms which reduce the teacher's teaching effectiveness. Pupils are uncomfortable and this leads to various pupils disciplinary problems The authors are therefore in agreement with the proposed plan to reduce the ratio and we are suggesting a further reduction to 1. 40 for greater effectiveness.

2. Inadequacy of facilities and staff in school ultimately leads to poor or little teaching and this results in poor performance by pupils. Since most primary schools are not government owned, it is suggested that government establish a high-standard inventory of facilities and staff for schools as well as ensure compliance by proprietors of schools

3. Truancy of pupils and lack of cooperation of parents in this respect contribute to poor performance of truant pupils as well as their drop-out rate. This also has implications on the rate of progress in the teaching which will be remarkably slowed down. There is need to urgently reactivate and restructure the School Management Boards and Parent Teacher Associations for more active involvement in the management of schools.

4. The negative attitude of young teachers to their work could cripple the whole primary education system if not properly put under control, since they are supposed to take over the administration of the school at the exit or retirement of the "old and experienced teachers". This calls for improved and more frequent level of supervision by the Inspectorate Division of the MOE and the school management.

5 Poor performance of pupils in English Language has significant implications for school effectiveness since the advancement of pupils to secondary schools after Standard 7 is based on successful performance in English; hence a school the majority of whose pupils could not pass in English Language and hence could not proceed to secondary school is regarded as ineffective or of low standard.

Unfortunately the various strategies that are currently been adopted to address these problems are short-term and are not as effective as expected. There is need for more radical and more revolutionary approaches to provide a long-term solution for primary school effectiveness. This is urgently necessary given the importance of primary education in the scheme of the educational system of the country.

Finally, at a time of so much change in education - introduced both by legislation and a well-understood need to ensure that pupils are given knowledge and skills appropriate to life in the 21st century — the research on school effectiveness offers a salutary reminder that what matters in education is the quality of learning and teaching

This cannot be guaranteed by legislation or by policy formulation alone. It is a product of deliberate strategies of teachers and the purposeful commitment of pupils within the positive climate of the school. The most important implication of this and other studies on school effectiveness for policy, therefore, is the need for the authorities — proprietors, school mangers, government, etc — to recognise this potential and to find ways of fostering school improvement programmes which can build on the research findings

Research Questions

The following research questions were used for the development of LOPEQ which ultimately provided the necessary information to deal adequately with the objectives of the study

1. What are the learning organization problems in primary schools?
2. What strategies have been adopted for solving problems confronting effective teaching and learning in the primary schools?
3. How effective are the strategies that can be adopted for solving problems confronting primary school learning?

4. What are the other newer approaches that can be adopted to achieve effectiveness in the organization of learning of pupils?
5. How adequate are the infrastructural facilities, including classrooms, desks and chairs in the schools?
6. How adequate in terms of quantity and quality are the teachers in the schools?
7. How effective is the management of human and material resources in the school?
8. How adequate in terms of quality and quantity are the material resources for the schools?

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26

ACTIVITY-BASED TEACHING-LEARNING STRATEGIES (ABTS) IN A LARGE-SIZED CLASS AT PRIMARY STAGE : A STUDY

M. Sharda

The study aimed at finding out the effectiveness of Activity Based Teaching-Learning Strategies (ABTS) in a large-sized class. The study revealed that ABTS were very effective even in large sized classes. The students enjoyed learning by doing. Learning situations could be managed with well planned activities. The implications of the study were that ABTS motivated the children to learn better, which led to retention and achievement. The study suggested that teachers should take up action research to find out solutions by themselves for the problems encountered by them in their classrooms.

Major Considerations for Taking Up the Study

The Demonstration School, being an NCERT school and a part of the Regional Institute of Education, Mysore, provides a lot of opportunities for its practicing teachers to take up 'Action Research' to find practical solutions to problems of curriculum and teaching encountered by them, through innovative experiments and practices in their classrooms. Working in such a school, the investigator got many opportunities to participate in various educational programmes on primary education. The information gathered and the experiences gained during various inservice training programmes at RIE, Mysore and at NCERT, DSERT and DIETs under SOPT and DPEP programmes, where the investigator worked as a resource person and gave demonstration lessons, enthused her to work on various classroom problems The primary teachers participating in these inservice training programmes opined that the implementation of 'Activity Based Teaching' is possible in small-sized classes but not in large-sized classes. They said that it is very difficult to implement any sort of child-centered activities other than 'Chalk and Talk' in their classes. They found it very difficult to manage their classes during the teaching-learning process. They also complained that they had not been provided with any materials or trained to implement ABTS in their classrooms The investigator was motivated by the problems of these teachers and took up this 'study' to have the experience of handling a large-sized class effectively and also to find out the various problems emerging in such classes which affect pupils' learning. After collecting information about the difficulties faced by the teachers in handling large-sized classes, the investigator decided to find out the effect of implementation of ABTS in a large-sized class. From previous experience, it was found that ABTS is very effective and promotes learning among students in a small-sized class. So the investigator took up this study with the following objectives

Major Objective

Are ABTS are equally effective in large-sized classes at the primary stage?

Specific Objectives

- To study the readjustments to be made in the ABTS for large-sized class teaching
- To study the effect of ABTS on learning in a large-sized class
- To study the motivation of children while learning through ABTS in a large-sized class.
- To study the managerial skills required for implementing ABTS in a large-sized class.
- To study the learner's problems while undergoing ABTS in a large-sized class.

Methodology

This study is an experience-based qualitative research study through the action research approach

Sample

The sample for this study included 70 children of Class IV in the Demonstration School, RIE, Mysore. However, in the Demonstration

School, a large-sized class situation does not exist. There are only thirty-five pupils in each section of Classes I to IV. Hence the investigator created a large-sized class situation by combining the children of both the sections of Class IV for her experiment.

Duration of the Study

April 1997 to September 1997

Content and Competencies

This study caters to some aspects of Environmental Studies - II. A few specific competencies under the following topics were selected for implementing ABTS.

1. Materials (matter) and their properties

Competencies

- Identifies common materials on the basis of some easily observable properties.
- Classifies given materials on the basis of colour, texture and hardness.
- States that matter exists in three states, i.e., as solids, liquids and gases
- Classifies common solids on the basis of breakable and not-easily-breakable.
- Classifies common solids as transparent and opaque materials.
- Classifies some common solids on the basis of solubility in water (soluble/insoluble)

2. Important functions of the human body

Competencies

- Knows the parts of — the digestive system
  — the respiratory system
  — the circulatory system
- Classifies parts of different functions of human body.
- Draws diagrams of different systems and labels the parts.
- Understands important functions of the human body.

The above ten competencies were taken into consideration to set ABTS in the large class. Apart from these competencies, the

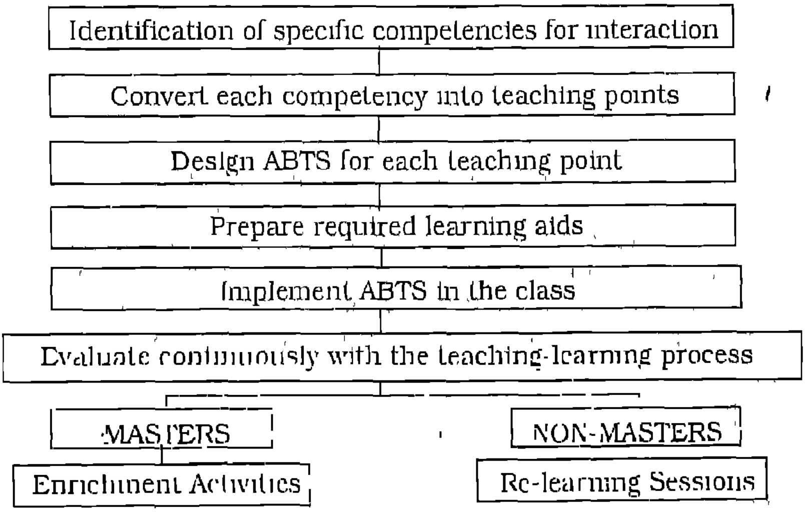
Lessons — (i) The Hospital, (ii) An Experiment, (iii) The parts of the Body — from English Reader were also selected since these lessons provide opportunities for the children to develop various skills.

Planning of ABTS

The selected competencies under the above mentioned topics were converted into teaching points For each teaching point, according to the interest, motivational level, ability of the students and the competencies to be developed in them, ABTS were planned. The elements of learning in each activity were listed. The required instructional materials and learning aids were prepared and kept ready for use. The ABTS were planned and developed with the following aspects in view

- From concrete experiences to abstract experiences.
- With the intention not to burden children with information which is out of their experiences.
- Learner-centred approach with teacher as a facilitator in the learning process.
- Management of space and time.
- Provide opportunities for various forms of expression such as drawing pictures, role-play, dramatization, conversation, etc
- Continuous evaluation with the teaching-learning process.
- Make children confident and inquisitive.

While planning for the implementation of ABTS in a large-sized class, the investigator decided to follow certain sequential steps which are given below in the flow chart.


Identification of specific competencies for interaction
Convert each competency into teaching points
Design ABTS for each teaching point
Prepare required learning aids
Implement ABTS in the class
Evaluate continuously with the teaching-learning process
MASTERS
NON-MASTERS
Enrichment Activities
Re-learning Sessions

Implementation of ABTS

There were five periods of half-an-hour duration each per week allotted for Environmental Studies-II. During the experimental period the investigator got around forty hours of classroom transaction. She has not taken any assistance from other teachers, while planning or implementing ABTS in the large class, in order to have an experience of single-teacher management.

The teaching-learning process incorporated the following strategies through the activity based approach:

1. Observation
2. Classification
3. Role-Play
4. Peer group learning/ co-operative learning
5. Discussion
6. Demonstration
7. Experimentation
8. Conversation/Dialogues
9. Project work/Assignment
10. Dramatization
11. Self-learning
12. Quiz.

During the experimental period, as far as possible, guided learning was avoided. Instead, the teacher as a facilitator of learning played an important role inside and outside the classroom. Since it was not possible to pay attention to each individual child, students were encouraged to learn by involving themselves in individual or group activities and the teacher gave instructions to carry out the activity within a time-limit. They were guided and helped by the teacher to prepare their own learning materials. A variety of learning materials were used to enrich the learning environment. The children displayed pictures, charts, models and posters collected or prepared by them, in the classroom. They were allowed to observe, handle, experiment and explain the same to their peers. These activities helped them to develop various competencies through self-learning, drill and co-operative learning During the learning process they were rewarded with appreciation. Most of the activities provided opportunities for self-expression There was provision for interaction between learner and teacher, among learners, between learner and learning materials. There was provision for self-correction and peer correction of the assignments. To make the learning situations more meaningful, interesting and joyful to every child, they were given ample opportunities, both individually and in groups, to observe, to record, to classify, to experiment and to interpret. Rote memorization was totally discouraged Instead, 'learning by doing' was encouraged.

An Illustration

ABTS were focussed on the learner. Hence every child in the experimental group was observed individually while taking part in the activities and was evaluated continuously Every activity was followed by discussions among the learners and then with the teacher. Here is an illustration

Topic The Digestive System

Competencies

i. Knows the parts of digestive system
ii Draws a diagram of digestive system and labels its parts.
iii Understands the function of digestive system

Teaching Points

i. Parts of digestive system: mouth, food-pipe, stomach, pancreas, liver, small intestine, large intestine and anus.
ii. Can the food we eat be used by our body as such?
iii. How does the food get digested inside our body ?

Strategies Followed

Observation, group-learning classification, discussion, self-learning, assignment and role-play.

Procedure Followed:

The digestive system was introduced as an 'Eating Machine'. The work of the internal organs were explained by comparing them to parts of a machine. Then questions like the following were asked to create an interest in learning among children. What will happen:

i. If one part of machine breaks down?

ii. If the workers go on strike?

Then using a model of digestive system, the process of digestion was explained.

The other activities conducted were:

1. Group Learning Activities

- i. To classify the external parts and internal organs of the body (4 pupils in a group).
- ii. To make parts of the digestive system, using clay, and make a model of the digestive system (7 pupils in a group)

2. Assignment

To make a chart of digestive system, with explanation (10 pupils in a group).

3. Self-learning/Individual Activities

- i To rearrange the cardboard cut-outs of parts of the digestive system.
- ii. To draw a diagram of the digestive system and label its parts.

4. Role-Play

- i. To enact roles as parts of the body.
- ii. To enact roles as parts of the digestive system.

5. Discussion

A discussion was held on the children's activities about the function of the digestive system and their doubts were clarified.

Similarly, various learning activities on the other selected areas of teaching-learning were also conducted and the learners were evaluated continuously for their attainment of the competencies.

Evaluation

The evaluation strategies used to measure the learners' achievement included the teacher's observation record of their participation in and contribution to various activities, oral question-answers in and competency-based written test. On the whole they were identified as masters or non masters. The non-masters who needed individual attention were provided the same by the teacher with the help of the masters. With their previous knowledge of working with their peers, they were encouraged to conduct experiments, observe and record by themselves. The teachers trust and acceptance of these children enthused the children to perform well. Success in doing one activity motivated them to do more activities. Since the activities were within the limits of the learners' abilities and because the teacher took the utmost care to break the monotony of work, the activities were enjoyed by them and resulted in mastery learning

The students were identified as masters and non-masters. The children who contributed the maximum, participated and involved themselves actively in all activities, did the assigned work in time, answered well for oral questions and scored 80% and more in the written tests (open book tests which were competency-based) were considered as masters. The remaining children were considered as non-masters. The child-wise record revealed the following results:

Evaluation Mode	*No of Students*	*Student's*	*Attainment*
		Masters	*Non-Masters*
Observation (of participation in classroom activities)	70	66 (94%)	4(6%)
Oral Tests	70	59 (84%)	11(16%)
Written Tests (Open-book tests)	70	58 (83%)	12(17%)

Summative Result

Evaluation Mode	*No. of Students*	*No of Masters*	*Percent*	*No. of Non-Masters*	*Percent*
Continuous evaluation	70	58	83%	12	17%

Eighty three percent of the children were found to have attained mastery learning at the end of the experimental period. The 17% students who remained as non-masters remained so mainly due to their inability to do well in oral expression and written expression. Eleven children in the class found it difficult to answer questions asked orally, even though they were allowed to answer in Kannada (their mother tongue) instead of English, which is the medium of instruction in the Demonstration School One child could answer in Kannada but was very poor in written expression So, all together, there were 50 masters and 12 non masters in the class. From the earlier years' records it was found that there were 19 non-masters, which included these 12 children. Surprisingly, 7 children from the non-masters group attained mastery learning which was mainly due to ABTS, even though the situation was a large-sized class

Findings of the study

It was found that:

- Proper pre-planning is required to implement ABTS in a large-sized class.
- Learning situations could be managed with well planned activities and by keeping enough materials needed to develop the required competencies.
- Learning strategies became successful since activities were drawn from or related to the child's experience/ environment.
- The pupils enjoyed ' learning by doing'.
- ABTS created coinfidence about learning even among non-masters.
- ABTS helped the children to engage themselves in acitivites even in the absence of the teacher.
- ABTS helped in large-sized class management.
- ABTS motivated children to concentrate on expected competencies and hence to achieve them at mastery level.
- ABTS were very effective in a large-sized class and helped the learner in concept-attainment and ability development.

Implications of the Findings for School Effectiveness

- The strategies used in this study to make children learn effectively in a large-sized class should be of great help to the teachers who handle such classes.
- Activities involving children in the teaching-learning process motivate the child to learn better and hence lead to retention and achievement, which is essential for universalisation of elementary education.

- ABTS provide immense opportunities for the pupils to develop social competencies like manipulation, self-management, ability to take leadership roles and group responsibilities.
- This study may enthuse teachers to take up 'action research' studies to find solutions by themselves for the problems encountered by them in their classrooms.

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27

TEACHING ENVIRONMENTAL STUDIES IN LARGE-SIZED PRIMARY CLASSES : EVALUATION OF SOME PRACTICES

M. K. Satapathy

The study was undertaken to discover an effective teaching-learning approach in a large-sized class for the teaching of Environmental Studies. Five common approaches, viz., lecture method (separately, with and without disturbing students' seating arrangement position), demonstration method, the activity method and group work method were adopted in five selected schools. The study revealed that the activity-based approach was the most effective in teaching Environmental Studies, followed by the demonstration method.

Introduction

The importance of a literate population has been recognised as a crucial input in nation-building and consequently Universalisation of Elementary Education has been accorded top priority in our national plans. Realisation of this goal has put the focus on three major aspects: universal access, universal participation and universal achievement. Increase in the enrolment rate in primary schools accompanied by increase in the country's population size has brought problems such as large-sized (crowded) classes, especialy in densely populated rural habitats and urban pockets, posing problems to the classroom teacher in keeping discipline as well as teaching besides paying individual attention to the pupils. Keeping this in view, some common approaches have been evaluated in the present study to find out their effectiveness in teaching Environmental Studies (EVS II, Science) in large-sized classes.

Methodology

The present study has been carried out in five higher primary schools of the Jajpur Education District of Orissa State. The schools were Nuahat H.P. School, Jabara, H.P. School, Odisso H.P. School, Singapore, H.P. School and Kalan School. Specific concepts in the topic "Living World" common to both Class III and Class V Environmental Studies (Science) have been selected for teaching. The student number varies from 35 to 49 in the selected classes in these schools (Table 1). Five approaches, such as the lecture method (separately with and without disturbing the pupils' seating arrangement), the demonstration method (with change in the seating position of the child from class to class), the activity method (with active involvement of the child while sitting in a semi-circle) and the group-work method (students divided into five groups, each group with a team leader) have been used for teaching the concepts. Local specimens, charts, etc., have been used in the last three methods

TABLE 1

Name of the School along with Number of Students in Class III and Class V

School	*Class III*		*Class V*	
	B/G	*Total*	*B/G*	*Total*
Nuahat H.P. School	24/20	44	21/18	39
Jabara H.P. School	24/18	42	27/21	48
Odisso H.P. School	25/21	46	28/21	49
Singapore H.P. School	21/14	35	27/14	41
Kalan School	21/18	39	22/19	41

B = Boys G = Girls

TABLE 2

Name of the School with Teaching Approach Adopted for Teaching EVS II in Class III and Class V

School	*Class III*	*Class V*
Nuahat H.P. School	Demonstration method	Lecture with change in the seating of pupils
Jabara H.P. School	Lecture with change the seating of pupils	Activity method
Odisso H.P. School	Group work	Demonstration method
Singapore H.P. School	Lecture method	Group work
Kalan School	Activity method	Lecture method

Note · Each method has been assigned to a class/school randomly

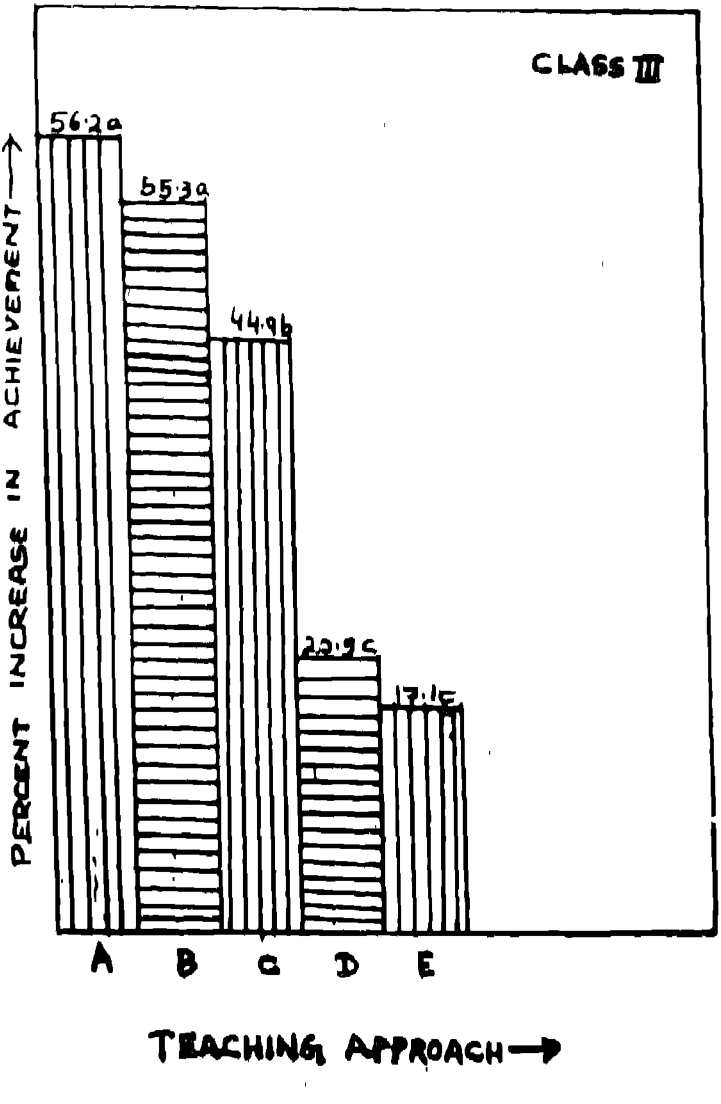

FIG.1 : Percent increase in achievement in post-test over pre-test in different approaches of Teaching (A, Activity-based approach; B, Demonstration, C, Lecture method with change in pupil seating, D, Lecture method without change in pupils seating and E, Group work method) EVS II in Class III)

Each method has been assigned to a class/school randomly (Table 2).The experimental one-group Pre-test-Post-test (Best, 1996) was used in the study. The classroom teacher was given specific instructions to adopt a particular method Three and four continuous classes, respectively, had been used by the classroom teacher to teach the concepts as included in the lesson in the class II and V textbooks Multiple-choice objective type questions had been used to assess the pupils' achievement. The 't'-test was followed to find out the significance of difference between the mean scores (in percent of pre-test and post-test) The percentage of increase in scores in the post-test over pre-test was compared among the treatments (methods) by DMRT separately for both classes.

Results and Discussion

Though the topic "Living World" had been selected for the present study for both the classes, the content was totally different There were eight major concepts in the topic in each of the classes. The 'Living World' in Class III mostly deals with classification of plants and animals, their body parts, interdependence between plants and animals, etc. (SCERT, 1995). The same topic in Class V mostly covers concepts such as adaptation of plants and animals to their environment, effect of climate change on plants/animals, germination of seeds, etc. (SCERT, 1997).

In both the classes there has been improvement in the achievement of students with teaching as reflected in the difference between post-test and pre-test scores (Table 3) The difference in the pre-test scores among the schools could be due to the level of literacy of the village, the socio-economic background of the families of children and their intelligence, etc Of the various approaches followed for teaching the students in large sized classes, the activity-based method putting the students in a semicircle was found very effective, followed by the demonstration method. Of course there was no significant difference between the two (Fig 1). In both the methods there was more than 55 percent of improvement in students' achievement In the group-teaching method there was only about 17 percent improvement while in the lecture method there was more than 20 percent gain.

TABLE 3

Mean Achievement Scores (in percent) of Class III Students with Different Approaches of Teaching of Environmental Studies (Science)

Approach	*Mean achievement score*		
	Pre-test	*Post-test*	*Difference*
Lecture method without change in seating	31.6 (±5.6)	38.1 (±3.4)	6.5**
Lecture method with change in seating	26.5 (±3.8)	38.3 (±2.9)	11.8**
Demonstration with change in seating	19.7 (±4.7)	30.4 (±5.1)	10.7**
Activity, sitting in a circle	33.8 (±4.2)	53.2 (±4.8)	19.4**
Group work	30.4 (±5.3)	35.6 (±5.7)	5.2**

Values in parentheses represent S.D. ** Significant at 1% level in 'T'-test

* Significant at 5% level in 'T'-test ns = non-significant

In Class V there was also a difference between post-test and pre-test scores (Table 4). Like in Class III, the activity-based approach was the most effective. The least effective method was the lecture method where only 22 percent of increase in achievement was observed. Teaching by the lecture method with change in the seating of the pupils has been found better than the lecture method alone — may be due to individual attention paid by the teacher towards the students and the students being attentive to their learning. The effectiveness of the activity -based approach (Harlen and Elstgeest, 1993) could be due to involvement of the students in learning different skills. This approach has been followed outside the classroom where the students have got adequate space to sit and work besides enjoying their learning. For Class V, recently Mishra (1996) has observed competency-based teaching along with child-centered learning and activity-based teaching to be superior to traditional teaching as reflected through the pupils' academic achievement and change of attitude. Group work, accepted as very effective (Shukla, 1996; NCERT, 1997) for teaching EVS II in large-sized primary classes, has not been so reflected in our present observation This could be due to either difference in the intelligence and background of the students or their place of school and habitat (urban/rural) or the absence of an ideal leadership.

TABLE 4

Mean Achievement Scores (in percent of Class V Students with Different Approaches of Teaching of Environmental Studies (Science)

Approach	Mean achievement score		
	Pre-test	Post-test	Difference
Lecture method without change in seating	26.3	32.3	
	(±4.3)	(±7.2)	6.0**
Lecture method with change in seating	18.7	24.6	
	(±6.7)	(±3.8)	5.9**
Demonstration with change in seating	27.5	44.6	
	(±4.8)	(±4.7)	17.1**
Activity, sitting in a circle	20.2	33.3	
	(±5.2)	(±5.9)	13.1**
Group work	23.6	29.7	
	(±5.8)	(±4.8)	6.1**

Values in parentheses represent S D

* Significant at 5% level in 't'-test

** Significant at 1% level in 't'-test

ns = non-significant

Environmental study has been included at the primary level/stage to develop an awareness and understanding of the physical and social environment of the child (Patel and Patel, 1994) through organised investigation and systematic exploration of his/her immediate and remote environment Through activities the child develops skills and competencies of the basic mental processes (Basha, 1993) of observation, recording, classification, collection, ordering of data, communication, prediction, inferences and ability to make proper decisions as reflected in the National Curriculum for Elementary Education· A framework (NCERT, 1988). The activity-based and learner-centered approach makes learning very effective and joyful as it involves problem-solving and learning by doing and hangs on the experience of the learner Moreover, the children develop the ability to cope with changes in their environment and also develop skills and competencies to face challenges they are likely to meet in future.

Implications of the Findings

The results of the study show that to make the classroom more effective as well as joyful in terms of learning, it is essential for the teacher to select a suitable methodology for large and crowded

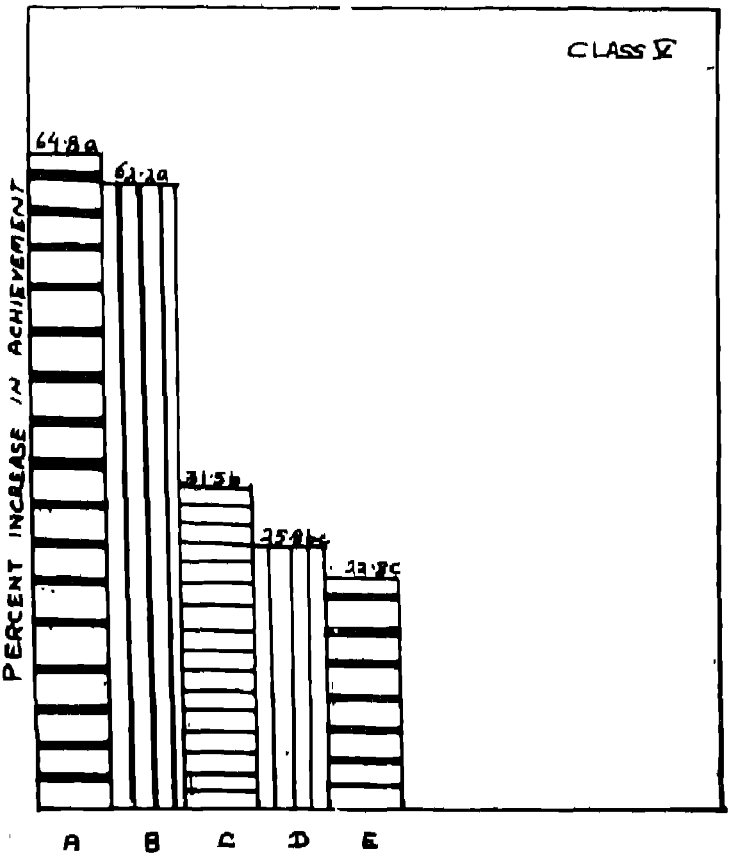

Fig. 2 : Teaching Approach

Percent increase in achievement in Post-test over pre-test in different approaches of teaching (A, Activity-based approach, B, Demonstration; C Lecture method with change in seating, D. Group-work and E. Lecture method) EVS II in Class V.

classes. In the future, as classes are likely to be more crowded, teachers may be given orientation/training in teaching of EVS following the activity-based approach so that the child gets involved in the process, enjoys his/her learning and gets individual attention from the teacher. Active involvement of the child in learning activity keeps him away from indiscipline and promotes the scientific temper which is essential in science learning. The teachers may also be given orientation in use of local-specificactivity-oriented materials as those because of their familiarity with students and teachers will help in attending competencies by students at the end of Class III as reflected by the MLL document (MHRD, 1991). A list of such activities for teaching EVS II in primary classes using local specific materials is available in the literature (Bhatacharya and Sharma, 1994, NCERT, 1996).

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28

INSTRUCTIONAL AND MANAGEMENT PRACTICES IN LARGE-SIZED CLASSES : REFLECTIONS ON CLASSROOM STRATEGIES

Pranati Panda

The study observed and discussed the prevalent instructional and management strategies adopted by teachers and the contextual constraints encountered by them in handling large-sized classes. The study concluded that a single prescription would not resolve this critical issue. An integrated model was suggested to strengthen the in-built strategies and resolving contextual constraints, to cope with the pressure of numbers while ensuring quality in learning. The study also recommended that both inservice and pre-service teacher training should address the pedagogical needs of teachers teaching and handling large-sized classes.

Introduction

Raising the achievement level of children at the primary stage has emerged as a major concern during the last decade. Concerted national efforts are afoot at different levels for improving the quality and efficacy of schooling. Various goals have been set to provide quality education to all primary-age children (Jomtein Conference). In recent years, strikingly the 'class size' issues that characterise the classroom situation in the primary sectors continue to attract the attention of educational planners and policy makers as an impeding factor for quality attainment towards school effectiveness

The class size in primary schools in India, on an average, has risen above the recommended norm. The determination to achieve 'Education for All', to attain 'Universalisation of Elementary Education' and the emphasis on eradicating illiteracy have immensely increased the number of pupils in the system. The rising social demand for education, and the phenomenal expansion of primary and secondary education in recent years, have led to an increase in the teacher-pupil ratio The threefold increase in population in the last 50 years since Independence and the large migration from rural sectors to urban areas have magnified the problem of large-sized classes in many parts of the country, particularly in the urban sectors

The class-size index is constantly increasing as is evident from the Sixth Educational Survey (NCERT). Enrolment data suggest that India has made much progress in enrolling 100 million children in 1993 from 85 million in 1987, with a 9 percent increase in the number of primary schools (530,000 in 1987 to 575,000 in 1993-94). Correspondingly at the national level, the teacher-pupil ratio has risen from 45.1 in 1986 to 49.1 in 1993, enfolding a wide range of situations across the States. With 150 million school-going children, 7,44,000 schools and 2.84 million teachers, India can boast of one of the largest infrastructure set-ups in the world But the expansion in terms of access and enrolment has not been matched by a comparable expansion of educational facilities despite implementation of various schemes. Accordingly, the children in the age-group of 6-10 in primary schools by 2007 (the final year of the 10th Plan) would require the building of as many as 1.3 million classrooms and the hiring of 740,000 new teachers (World Bank, 1996).

The large-sized class, as has been seen, is the result of shortage of space, and of teachers or of both. Non-availability of adequate space in the existing school buildings, absence of budgetary provision and non-availability of additional teachers are some of the factors responsible for its emergence. Many schools are under tremendous pressure to accommodate students much beyond the capacity of their buildings. This stance was reiterated by the Education Commission way back in 1964-66, reflecting on the difficulties of teaching large-sized classes and recommending the maximum class size of 50 and 45 at the lower primary and higher primary stages respectively.

School effectiveness surveys commonly collect information on pupil teacher ratios and average class-size Much research has been conducted into the effect of class-size on the education of young children (Blachford and Mortimer 1995). The findings of these studies indicate the multifarious effect of class-size upon pupil attainment, progress, behaviour, conduct, self-concept and motivation and classroom climate and management. (Doyle, 1970; Glass and Smith, 1979, Glass, 1981; Robinson and Wittebols, 1986; Salvin, 1989; Finn and Achilles, 1990). There are conflicting results with regard to the relationship between class-size and achievement (Fuller and Clerk, 1994). A number of studies have indicated that with the use of innovative teaching techniques, educational technology, increasing school time as a pre-condition for handling large-sized classes, can help to a great extent in effective teaching and learning (Jamison, 1982; Ross, 1983; Singhal, 1988).

The large-sized class poses multifarious problems both for the teachers and students. Child-centered education which entails individualisation in the teaching-learning process, cannot be achieved to a great extent in large-sized classes. Few would dispute that a large class poses a more difficult management problem also. Hence, some of the constraints in which education is imparted are:

1. The teacher has to handle 5 to 6 classes per day along with other official/clerical work.
2. Each subject has its own objectives that need to be transacted properly.
3. Class/home work to a certain extent need regular correction.
4. Every class has a heterogeneous composition
5. The large-sized class is here to stay for good many years to come.

The Present Study

Though a large-sized class seems to be very unmanageable, the situation calls for effective planning and developing of new strategies/ techniques for optimizing its effective handling. Such a situation is a sufficient justification to search for appropriate methods, newer strategies for organising learning of pupils.

Upon considering the above background scenario, and recognising the importance of the above mentioned issues in judging the quality of a school, this study tries to discern and document the innovative instructional and management practices devised by the teachers themselves in large-sized classes to facilitate their teaching and managing a large number of students effectively. The evidence based on the data gathered from large-sized classes Considering the thrust placed on improved teaching and learning, documentation of different strategies would facilitate the teaching-learning process in the large-sized class.

For the purpose of the present study, "A large-sized class at the primary level, has been operationally defined as a monograde class with more than sixty students either comprising one section or combination of two sections (for long term arrangements) but not exceeding more than eighty students."

Objectives

- To study the prevalent classroom instructional and management strategies followed by the teachers of the large-sized class.
- To study the problems faced by the teachers of the large-sized class relating to instructional and management practices
- To suggest an integrated approach for effective handling of the large-sized class at the primary stage.

Research Design

The study was essentially a field study using qualitative research techniques. Classroom observation, a conversational methodology (Beard, 1989) or semi-structured interview and Focus Group Discussion have been used to observe real classroom practices and to give opportunity to the respondents to address a range of issues which they consider relevant for their practices. The limitations of this approach as described by (Pope and Deni Colo, (1990), Atkins, (1984) are fully recognized but, and Atkins agrees, the information yielded from such semi-structured research techniques is not only "rich and interesting" (Atkins, 1984), it helps us get beyond form and structure to the realities of managing large classes (Walker, 1986).

Sample

The sample consisted of 15 primary schools of the Municipal Corporation of Delhi having class-size of 60 and above. The selected schools functioned in double shifts-catering to girls in the morning shift (7 30 A M. to 12 30 P.M) and to boys in the afternoon (1.00 P.M. to 5.30 P.M). Being located in resettlement colonies and slums, these schools are mainly serving children of low socio-economic status. The study was limited to Classes III and IV, on the basis of the number of pupils ranging from 60-80. The total sample comprised

15 schools, 58 class teachers from Classes III and IV and a total number of 175 teachers belonging to Classes I-V of all the 15 schools.

Tools Used

The following tools were used for the purpose of data collection

1. *School Information Schedule*: This tool was used for collection of preliminary information on existing class-size (teacher-pupil ratio), teachers' strength, their educational and professional qualifications, inservice training, physical facilities, available instructional materials and teaching aids, etc., which are considered to be the pre-condition for effective instructional practices in large-sized classes.
2. *Classroom Observation Schedule* : This schedule was based on various broad indicators — use of voice, blackboard writing, use of teaching aids, classwork and homework, explaining and questioning, organisation of activities (learners' involvement), evaluation and feedback and organisation of curricular activities etc. This provided a broader perspective from which it was hoped that a set of strategies used by the teachers for effective handling of large-sized classes would emerge.

Data Collection and Analysis

On a visit to each of these schools, data related to teaching and management strategies were collected through the qualitative research techniques as mentioned earlier. With the help of broad indicators mentioned in the observation schedule, subject specific observations were made (mathematics, language, environmental science) along with curricular activities. A conversational methodology or semi-structured interview was adopted to seek further information regarding the problems faced and the rationale of using the observed strategies from the teachers whose classes were observed earlier. Focus Group Discussion was also conducted with all the teachers, irrespective of their teaching different classes, to give them opportunity to address a range of instructional and management strategies which facilitate their teaching and students' learning in large-sized class.

Instructional and Management Strategies in Practice

The qualitative analysis of the data has revealed that a large number of strategies are being used by the teachers for handling a large-sized class effectively at the primary level. The strategies used by the teachers differ from subject to subject and even from topic to topic to achieve the twofold objectives, i e., to facilitate their teaching and to ensure learners' achievement. An attempt has been made to filter the various strategies used by the teachers for further dissemination. The most prevalent instructional and management practices are discussed under two heads:

- Instructional and management strategies
- Space management.

I. Instructional and Management Strategies

Integration of Content Areas

At the primary level, the school curriculum is divided into separate subjects. A single teacher needs to transact all the subjects in a day as per the prescribed time table. In the context of the large-sized class some teachers teach by amalgamating the different content areas. To give a specific example, a teacher used the plant as a focal point and investigated the topic from the perspectives of mathematics, environmental studies and language. Very frequently, teachers combined environmental science with Language, and physical education with mathematics and science To achieve this, the classes were divided into 2 to 4 groups depending on the integration of subjects and the subject groups were divided into subdivisions for organising small-group activities, explaining and giving feedback, assigning and checking class work. Rotation of the subject groups took place so as to ensure that each group learned each subject. In this process, direct teaching was always followed by peer-tutoring and monitorial assistance, ensuring greater learners' involvement.

Using Local Specific Content

It was quite revealing that many teachers used the contextual teaching approach in large-sized classes. To arouse interest amongst 60 to 80 students, teachers had to initiate teaching relating to local-specific contexts or examples from the day to day activities of the children, keeping in view the differential social background of the pupils. They felt that such a technique facilitates both teachers and students to work further on the content in explaining the difficult words and sentences.

Peer-Tutoring

Peer-tutoring implies using students as resource to ease the pressure on the teacher's time. More than one teacher categorically pointed that "Numbers are not my problem it is the motivation and involvement of students. Through peer-tutoring I could manage to achieve this." The majority of lessons observed were well organised and planned, devoting 20 to 25 minutes for direct teaching, subsequently followed by peer tutoring It was observed that those students who completed the work quickly and achieved mastery level of learning served as volunteer tutors for the average and just-below-the-average students. In the meantime the teacher tried to concentrate on below-average students along with monitoring peer tutors and their progress.

It was observed that peer-tutoring was frequently used in subjects like mathematics and language, where peer-tutors assisted the peers by explaining difficult sums, difficult concepts, reading, and writing work (matras and sentences).

During the interview sessions, the teachers emphasised that peer-tutors get themselves, trained enough to explain difficult concepts by giving contextual examples which teachers felt that student understand better because of the local language used by the peer tutors. In accordance with the teaching strategy, the teacher organised the seating arrangement such that the peer-tutor could extend help to the peers around him as and when the requirement arose.

Group Work

Group work in large-sized classes is generally organised around topic of a subject in the form of map-reading, mutual dictation, solving sums, quiz, antakshari, word game, etc. As expressed in the Focus Group Discussion, the teachers pointed out that 'partner exchange' and 'group rotation' facilitated the organising of group work The group leader was selected by the teacher on rotation for not more than a week's or a fortnight's duration, thereby extending an equal opportunity to all children to work as a group leader.

Monitorial Assistance

The monitors had a specified role to play for better classroom organisation and sharing responsibilities in the large-sized class. It was quite heartening to observe that the class size of 60 was having 6 to 7 monitors. To facilitate control, each row had one group leader (monitor) who tried to maintain discipline, to check copies, to display teaching aids, and to inform about the progress of each and every child of that particular row to the teacher The other monitors regularly carried out their assigned work, like collecting mats, distribution of midday meals, some manual activities etc.

Team-Teaching/Sharing Responsibilities

Team-teaching in large-sized classes, though not much prevalent, was observed in one school where two teachers were sharing the same platform to teach a science topic. When one teacher was explaining the concept, the other was preparing for the conduct of activities and moving around the class to maintain discipline The team teaching efforts were extended towards correcting copies and providing immediate feedback to each group on a sharing basis

During the course of the interview, two teachers reported that in their combined efforts, they grouped the students from two sections on the basis of their ability. Weak students (particularly in language) were made to sit in a separate section and were taught the language from Class I onwards, till they came upto the level of other students reading in Class IV. Both the sections were taught by these two teachers in rotation, along with the help of peer-tutors They emphasised that on the basis of their combined efforts, they could manage to bring weak students to the level of other students of their class, and thus this strategy facilitated their regular teaching.

Evaluation and Feedback Strategies

In the large-sized classroom, pupils' evaluation and providing feedback to pupils is a difficult task as expressed by the teachers. To achieve this end, it was observed that teachers were assigning class work in only two subjects mainly mathematics and Language, per day, and adopting their own way of correcting and providing feedback. Very often, they engaged children for self-evaluation from the blackboard, but those students who failed to do the same on their own were always assisted by the peer-tutors or monitors of each row or of the assigned group Spot checking by the teachers and giving immediate feedback and cross-checking by the pupil themselves were some of the practices adopted in the large-sized classes. In many instances, a few strategies were put together for quick evaluation and providing feedback with the help of the team-teacher, peer-tutors and row-monitors

Use of Cues

To avoid a high-pitched voice, very often teachers used cues for effective classroom management. Writing in bold letters on the blackboard, showing cards for assigned activities, finger movement, maintaing silence for a while and clapping by students, were some of the cues used by the teachers to maintain discipline and to carry out multifarious activities in the large-sized class set up.

Pupils' Self-Help Strategies

A variety of self-help strategies used by the pupils were evident through classroom observation Because of a large number of students, teachers tried to develop pupils' independence through self-learning (drilling), silent reading, self-evaluation, etc

II. Management of Space : Seating Arrangement

The large-sized class is the result of shortage of classrooms or school space or both. Constraints of space create obstacles in the smooth transaction of curriculum and in classroom management. This immediately implies that the concept of space is limited to the pedagogy being practiced. The classroom, built earlier to accommodate only 40 children, now accommodates larger number of children ranging from 60-80.

It became evident from our observation that a few innovative seating arrangements adopted by the class teachers in utilising the available infrastructural facilities enhanced their teaching effectiveness and efficiency. The teachers clarified that they adopted these seating patterns in order to:

- minimise the management problem,
- keep all children in the attention zone,
- provide adequate space for seating, writing and keeping bags,
- provide space for teacher movement,
- facilitate peer-tutoring and group work,
- write conveniently from the blackboard,
- minimise the noise distraction.

Hence, some of the frequently adopted seating patterns which facilitated teachers in their day-to-day teaching, in organising group work to keep children in the attention zone and in facilitating peer-tutoring have been discussed below.

Split Half

It was interesting to note that, to avoid the critical situation of shortage of space, a few teachers had adopted the split-half seating pattern where the whole class was divided into two groups (30 in each group). Half the class was seated inside the classroom, where the teacher was engaged in doing blackboard work or explaining difficult concepts, whereas the other half was made to sit in the verandah doing self-study or assigned activities with the help of peer-tutors A single teacher was teaching both the groups in rotation with the help of peer-tutors and monitors. While expressing their views the teachers mentioned that the change in season pushed them to organise this seating pattern to avoid suffocation and vomiting, particularly during summer.

Vertical Single Row

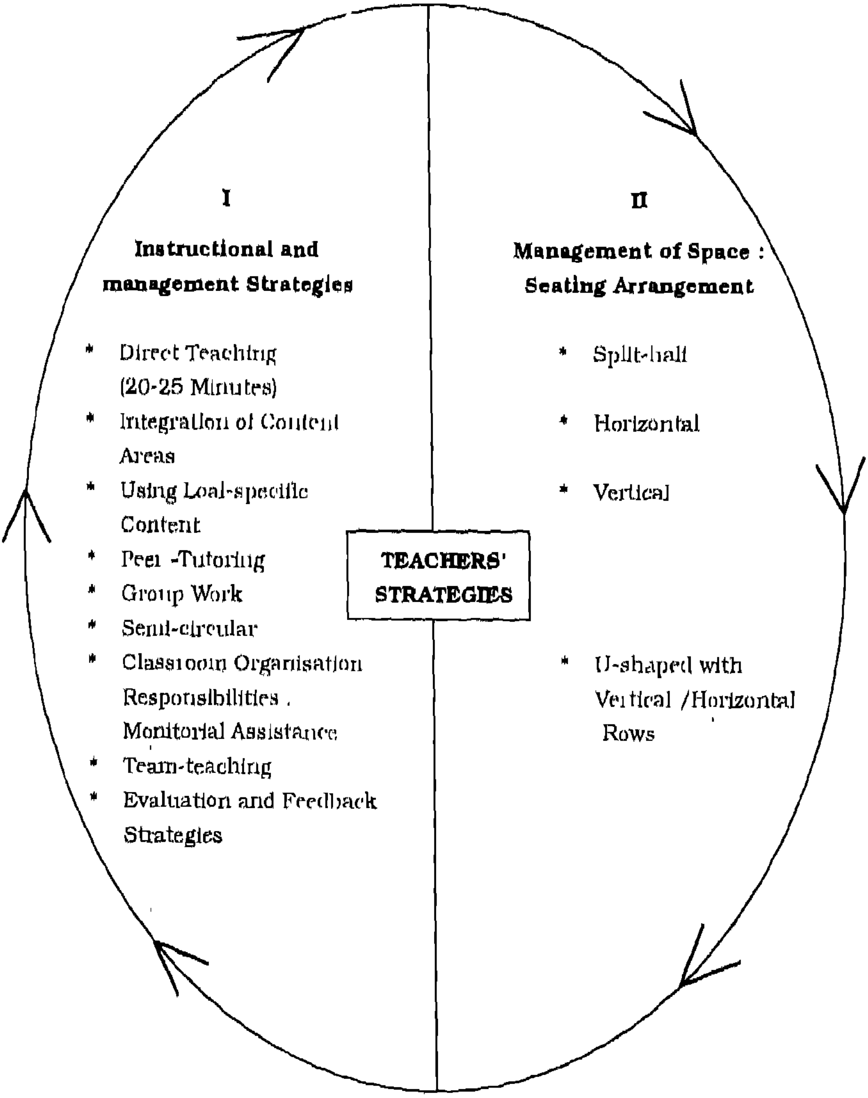
We observed a seating pattern combining bright, average and weak students in a vertical row of 12 children to facilitate peer- tutoring and organisation of responsibilities through monitorial assistance. The class of 60-70 had 5 to 6 vertical rows, leaving space in between the rows for the teacher's movement and for keeping bags. Most of the time children were using their knee as a support for writing. Because of the flexible seating pattern on the floor mat, the children could shift their positions to make themselves comfortable while writing from the blackboard and listening to the teachers, for peer-tutoring and for group-work.

Horizontal Single Row

Another most prevalent seating pattern was the horizontal approach, where the children sat in a horizontal row, leaving a one-foot gap for the teacher's and peer-tutor's movement and for written work. In a class of 70, each row had 14-15 children forming two blocks of 7-8 children in the same row Many teachers expressed their preference for this pattern, as it made it possible for them to approach each and every child in spite of their large numbers.

U-Shaped Pattern with Vertical and Horizontal Rows

In few schools where the class-size exceeded 70, an innovative kind of seating pattern was adopted by the teachers to accommodate the large number of students. The teachers managed the space by arranging U-shaped seating patterns with vertical/horizontal rows, keeping in view the multilevel grouping of students for conduct of small-group activities. Thirty to thirty-five students were made to sit in a U-shape around the three walls of the classroom, accommodating 30 to 40 students in vertical/horizontal rows in the middle As has already been mentioned earlier this did help them for peer-tutoring, group work and writing from the blackboard


I
Instructional and management Strategies
* Direct Teaching (20-25 Minutes)
* Integration of Content Areas
* Using Loal-specific Content
* Peer -Tutoring
* Group Work
* Semi-circular
* Classroom Organisation Responsibilities . Monitorial Assistance
* Team-teaching
* Evaluation and Feedback Strategies
TEACHERS' STRATEGIES
II
Management of Space : Seating Arrangement
* Split-half
* Horizontal
* Vertical
* U-shaped with Vertical /Horizontal Rows

SUMMARY OF STRATEGIES ADOPTED BY
TEACHERS OF LARGE-SIZED CLASS

Constraints Encountered by Teachers while Implementing Instructional and Management Strategies

Most of the school hours were spent in observing classes and conducting interviews, and at the end of the day Focus Group Discussions were organised with an attempt to ascertain some of the specific constraints encountered by teachers in implementing instructional strategies in large-sized classes and their suggestions to resolve them Summing up the sentiments of many teachers', "Large-sized classes do not have any advantage for the learners as the problem is inextricably *interlinked with number of contextual factors."*

Working Conditions

- The problems specific to the sampled schools stem from the fact that existing classrooms were not built to accommodate a large number of students.
- The teachers explicitly stated that the shortage of teachers was a chronic phenomenon, forcing them to take combined classes for years together.
- The overwhelming view expressed in all schools was that there was excessive demand on teachers' time. Teachers in large-sized classes found things more difficult and expressed their desire to be allowed freedom from routine and clerical work
- The most relevant issues, according to the teachers were. time coverage of the syllabus which is inhibited to a great extent by the nature of large-sized class coupled with the low language proficiency of the children; the rigid time table which allowed 45 minutes for each subject again hindered the classroom transaction process to a great extent. Raising this issue, they demanded a for squeezed syllabus (reduction of chapters) and a flexible timetable so as to facilitate mastery learning instead of fragile learning.
- Though each school had been supplied with OB kits, tape recorder, and other teaching aids, a major difficulty in using them was incompetence to handle the equipment and integrate it with the topic of a subject. Substantiating their views with other reasons, they pointed out that aids were of an individual nature, non-functional for group use. Hence, teaching aids which are meant for group use and, are unbreakable in

composition should be provided and training must be provided in the use of teaching aids and preparation of low-cost teaching aids

Pupils' Differential Social Background

- The teachers expressed the difficulties faced by them in dealing with children of differential social background Many a time they felt helpless and incapacitated in dealing with this difficult issue because of irregular attendance and apathetic attitudes of parents towards their children's education. They insisted on the greater involvement of the PTA and the members of community.
- The situation becomes more critical when there is demand for religious prayer, which they felt was a major constraint to the smooth flow of teaching.
- Stressing the shortage of space, the situation gets aggravated when some children had to bring their brothers and sisters to the class as a help to their working parents.
- Pointing to the poor socio-economic background of the children, the teachers categorically mentioned that it is their economic condition which prevents these children from buying notebooks to be used for the assigned classwork and homework. Teachers insisted upon the preparation of books containing self-study materials along with adequate space for practice, and supply of notebooks and stationery to the children by the government.
- The most pertinent constraint faced by these teachers was poor language achievement of the children, due to non-comprehensibility of the language used in the textbooks.

Relevance of Training

During the course of the discussion, almost all teachers expressed their reservation about the relevance of preservice and inservice training for effective handling of large-sized classes

- Stressing the inadequacy of preservice training, they emphatically mentioned that teaching methods were taught in isolation and desired a shift from isolated methods towards an integrated approach, which would help them in organising and managing learning activities in large-sized classes,

- While focussing on inservice training, almost all the teachers mentioned that they have been exposed to various INSET programmes in the form of induction training, seminar and workshop which they mentioned is mandatory (21 days of INSET) for getting further promotion. Though they have been oriented to the new education policy, child-centred and activity-based teaching, joyful learning, continuous and comprehensive evaluation, they pointed out that, "No one had ever discussed how these instructional practices can be inter-woven into the large-sized class system and can be optimally used." In turn, they expressed their eagerness to attain class/school-based contextual INSET relevant to large-sized class issues on recurrent basis

The real issue as viewed by the teachers was that their problems were exacerbated by too much time spent on maintaining discipline and a disappropriate amount of time spent on administrative activities.

Implications for School Effectiveness : Suggestions for an Integrated Model

The present study has revealed that various innovative instructional and management strategies are being practised by teachers to handle large-sized classes in spite of numerous contextual constraints In fact, these strategies are in-built in the system. However, the teacher themselves are neither aware nor do they know these strategies could be used in a more effective manner Single prescription will not help to resolve this issue. Hence, an integrated model has been suggested and simultaneous adherence to all the approaches may strengthen the effective use of classroom strategies being used by the teachers themselves in their own context. At this juncture, it needs to be acknowledge that, the problems of the large-sized class have not been properly grasped and comprehended by the teacher community, by educational administrators and by other personnel involved in this area.

Teacher Training

Teacher training is the corner-stone and an essential stage in the practical reform of the education system.

- Hence preservice teacher training needs to respond immediately by changing/adopting a new methodology of teaching which will help the teacher in large-sized classroom practices. Commenting on this issue, the Kothari Commission had pointed out. "It is the responsibility of the training institutions to have a more practical approach to the problem and evolve methods which would help the teacher to teach a large-sized class, without a complete abandonment of all pedagogical principles." Hence certain practices can be borrowed from the active method and adopted to the culture and socio-economic and socio-linguistic characteristics of the pupils. Practices like cooperative teaching and learning, collaborative learning and peer-tutoring, must be inducted into the pre-service system.

- Although the initial training is of great benefit to the individual, continuous inservice training is needed for acquiring information, knowledge and skills. As an immediate measure, self-instructional module packages need to be prepared either by the experts or through on site production by the teachers along with DIET faculty. Acknowledging the problem of the large-sized class, school-based, contextual INSET may help the teacher to a great extent to strengthen the already prastised strategies.
- Lastly, distance education may be given priority through supply of self-instructional modules supported by audio-video cassettes, through multi-media packages and also using teleconferencing approach. Hence, multi-approach INSET is the need of the hour to resolve these difficult issues.

Curriculum and Syllabus

It has already been pointed out that the curriculum and syllabus, which is meant for normal class size, may be reduced to a certain extent in order to help the teacher to adopt the activity approach instead of direct teaching. Hence, there is a need for a remodeled syllabus of local-specific material so as to arouse and sustain interest. Self-study materials providing scope for multifarious activities need to be prepared to strengthen the adopted strategies to handle large-sized classes. This will definitely determine the shift towards active learning in the large-sized class. The rigid classification of syllabus into subjects may be done away with to a certain extent so that some integration and co-ordination may be possible.

Teaching Aids

Teaching aids are of immense significance in the context of the large-sized class, which would facilitate easy interaction and learning amongst a large number of children. Local-specific low-cost teaching aids may be supplied for different subjects, along with adequate training of teachers. For the large-sized class it would be preferable to use some useful materials/aids which can be used again and again for diverse purposes than to use a large variety of materials In this context emphasis must be laid on the production of equipment and materials which are meant for group or collective use.

Educational Technology

As we are entering the information age, importance of educational technology in the context of the large-sized class can not be minimised. Hence, there is a need for greater use of the first, second and third generation of technology starting with the audio, video on to multimedia and computer, which really would facilitate teaching and learning in the large-size class

Administration and Management

- There are numerous large-sized class issues relating to administration and management. Few would give cause for discussion as they do not involve much fiscal constraint. Adding and repairing a few classrooms and planning out a transfer policy may help to solve the present issues to a great extent. Administration and management should see to it that teachers are not involved in multifarious administrative activities as the teachers of large-sized classes are already burdened with planning, organising activities, solving individual problems, and checking classwork and homework.
- The possible introduction of flexible timetabling will help the teacher in the teaching-learning process, in organising activities and in adapting various strategies. The timetable may be so arranged that one period of class work may be followed by one period of activity including drill, map reading, self-study, etc.

Community Support

The school-community partnership with the help of the educational authorities is viewed as a basic prerequisite to resolve a few large sized class issues. Apart from generating pressure to get more teachers, community members, who can spare a little of their time may be oriented to assist teachers Frequent meetings of the PTA can resolve some of the basic constraints which the teachers face in their day-to-day teaching.

Conclusion

The large-sized classes are the hard reality in our country and should not be regarded as a stop-gap phase. They are and must, therefore, be regarded as an integral part of the primary education system. It has to be acknowledged that at present the problem of large-sized classes has not been properly grasped, with the result that there is lack of a clear awareness of it on the part of those responsible for planning and implementing.

The present research study on large-sized classes analysed the classroom instructional and management practices and the constraints encountered by teachers. On the basis of the emerged findings, an integrated model has been suggested to strengthen the in built strategies and resolving contextual constraints, to cope with the pressure of numbers while ensuring quality in teaching and learning. A 'Systems Approach' has to be followed for the implementation of this integrated model in large-sized classes. This will facilitate decision making at all levels and can unquestionably form part of an overall scheme of action to handle large-sized classes effectively. Hence there is need to take a positive view which would embrace not only pedagogical improvement and change in curriculum, adopting no-cost teaching strategies but would also increase the use of educational technology to attain quality basic education for all.

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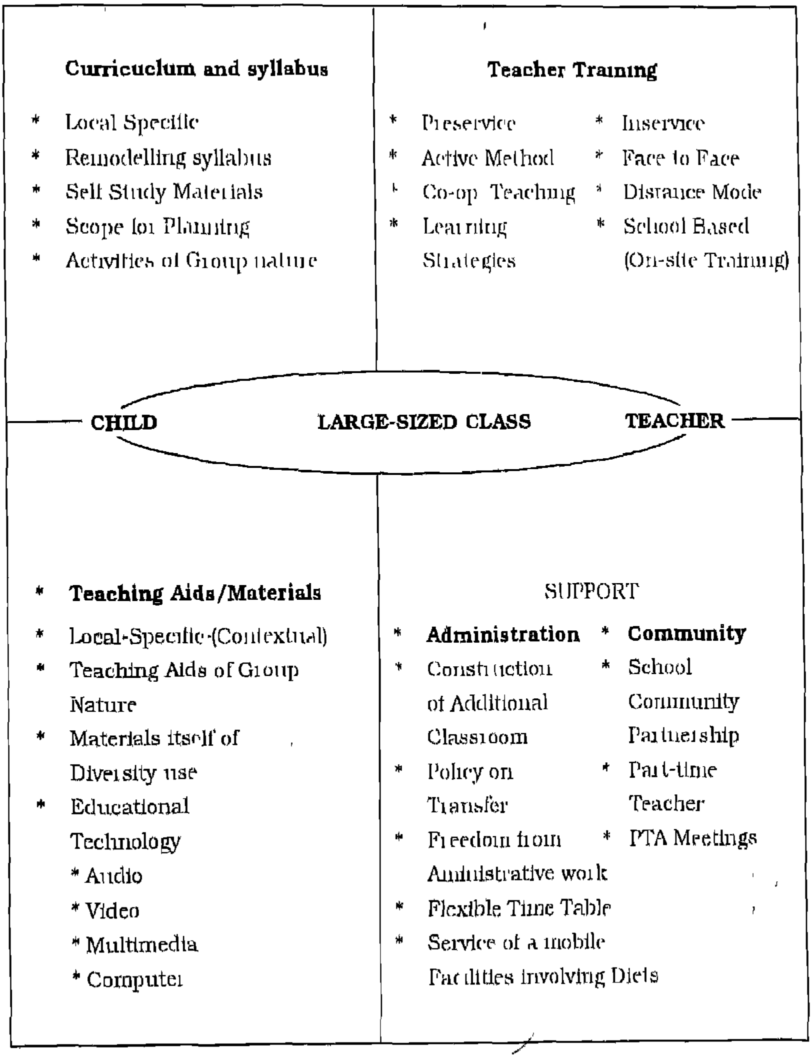

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POSTER SESSION

Community Participation and School Effectiveness

The report studies are :

- Learning Achievement of Children Studying in Alternative Schools of DPEP Districts of Madhya Pradesh
- Effectiveness of the Strategies in Developing Map-reading Skills in Large-sized Classes at Primary Stage – A Study
- Enhancing Learning School Language of Disadvantaged Learners through the Use of Home Language in Multigrade Schools

29

LEARNING ACHIEVEMENT OF CHILDREN STUDYING IN ALTERNATIVE SCHOOLS OF DPEP DISTRICTS OF MADHYA PRADESH

V. P. Gupta; Reeta Sharma; V. P. Singh

The study examined the learning achievement of children in language and mathematics in 30 Alternative Schools in six districts of Madhya Pradesh. The low mean scores of children in simple statement-type items in mathematics were strong indicators that there was very little emphasis on understanding the concepts. Also, children were found committing mistakes of 'matras' and other grammatical mistakes. It was suggested that these findings might help the planners to improve multigrader/multilevel teaching for universalisation of primary education.

Introduction

Universalisation of Primary Education (UPE) is the concern of one and all for the welfare of the society and development of the nation but it cannot be achieved only by the formal system of education. UPE can only be attained by the concerted efforts of all concerned for education. Some alternative flexible strategies have been thought of by the academicians and the policy planners for the disadvantaged group of the society who cannot attend the formal schools. NPE (1986) and POA (1992) envisaged a large and systematic programme of Non-formal/Alternative Education for habitations without schools, for drop-outs, for working children and especially for the girls who cannot attend the whole day schools. Alternative Schooling (AS) is one such concept under DPEP (RGPSM, 1994) intended to take school to the doorsteps of the learners if they cannot attend the formal schools with a rigid framework. Andreas (1996) consider AS as a device to be used where social or individual needs are not adquately fulfilled by the existing educational establishment.

Alternative Schools (AS) were opened in the then 19 DPEP districts in Madhya Pradesh in 1995-96, and many more have been opened since then by the Rajeev Gandhi Prathmik Shiksha Mission (RGPSM), Bhopal, the apex body looking after primary education in the DPEP districts of the State. Textbooks for these schools were prepared by RGPSM with the active cooperation of Digantar, Jaipur — one of the NGOs working in the area of alternative schooling, State Resource Group and MPSCERT, Bhopal. To start with, AS were opened in areas whose population was below 250 persons and there was no formal school or a NFE centre in the village Two local teachers — one male and one female — are provided in the school and the school functions daily for 4 hours, either in one or two shifts. There is one supervisor for every 10 schools to help the teachers in teaching and for monitoring the progress of the children. It is essential for the teachers and supervisors to undergo 21 days' training before they join these schools. Monthly review meetings are also held at the Block HQ to solve their academic, administrative and financial problems

Objectives, inputs or teaching-learning strategies and evaluation are the three essential interlinked aspects of any educational project. Evaluation is done to find out answer to the problem whether the predecided objectives of the project have been achieved and to what extent. One of the objectives of opening the AS was to bring about qualitative change in the learning behaviour of the children. Learning by students at their own pace is the key word of the philosophy of the AS. Though there is no concept of pass and fail in the Alternative Schools of Madhya Pradesh State, yet it becomes pertinent to measure the level of achievement of children after one year of commencement of the schools It was in this context that RIE, Bhopal, was requested by RGPSM to carry out evaluation in the six DPEP districts, namely, Betul, Dhar, Raisen, Rajgarh, Rewa and Sehore in October, 1996 (Gupta, et al, 1997) The other 13 DPEP districts were given to other two agencies, namely, MPSCERT, Bhopal and Digantar, Jaipur. This paper is a part of the above evaluation study and deals with the learning achievement of the children (N : 407) in Hindi language and Mathematics (N·393) studying in Alternative Schools in the above-mentioned six DPEP districts of Madhya Pradesh.

Objectives

The study was conducted with the following objective in view

- To assess the learning achievement of children studying in Alternative Schools for the last one year, in Hindi language and mathematics.

Methodology

The sample size, design of the study and development and administration of tools are described below:

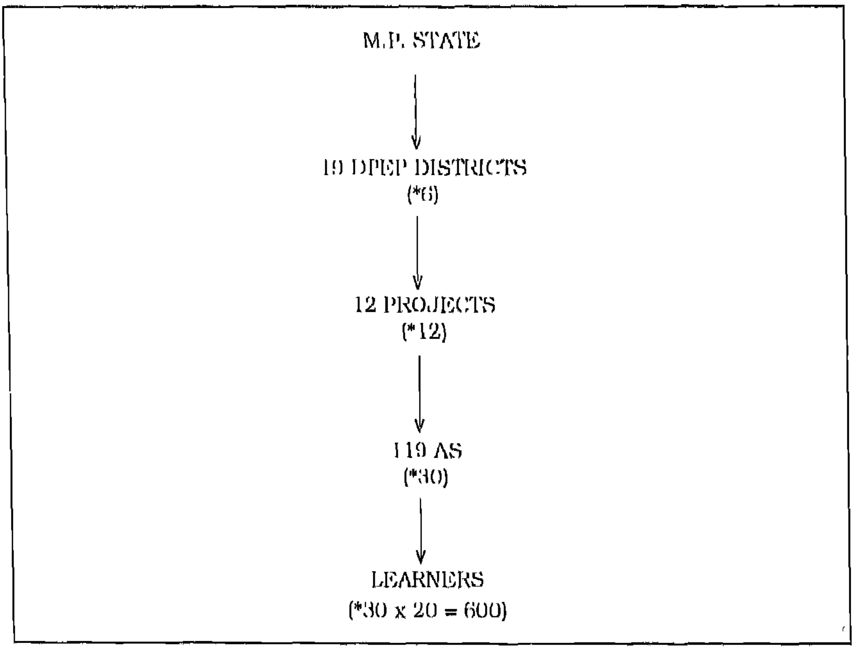
Sample Size and Design of the Study

119 AS were functioning in 11 blocks of the six districts in the form of 12 projects in the year 1995-96. As per terms of reference of RGPSM, 25% of the AS, i.e., 30 schools, were to be selected for data collection from the 12 projects.

On an average 2-3 AS were randomly selected from each project for data collection. Thus, the data were collected from 30 AS from the six districts. The design of the study is given in Table 1.

TABLE 1

Sample Size and Design of the AS Evaluation Study



* Sample size for data collection. Hindi language test could be administered to 407 children and the mathematics test to 393 children

Development and Finalisation of Tools

The construction of the tools and their administration is the crux of any study. The learning achievement of children was assessed with the help of two tools — one for mathematics and the other for Hindi language. The tools were constructed in collaboration with the MPSCERT. The efficacy of these tools was tested by administering them to 122 children in mathematics and 120 in Hindi language from 7 Alternative Schools situated in five districts, except Rewa.

The tools were modified and finalised in another workshop held at RIE, Bhopal, in December 1996 on the basis of feedback received from the field. MLLs developed by the Department of Education, MHRD, GOI, New Delhi, and brought out by NCERT (1991), and the books being followed at the AS and the formal schools were also consulted. Some oral type items were also included in the tools to reduce the writing burden on the small children.

Tool for Mathematics Test

Tool No. 1 was developed to assess the learning achievement of children in the different competencies of mathematics. It consisted of 9 test items, with 14 sub-items of 50 marks. No time-limit was kept for the test as it was found while testing the efficacy of the tools that the children took a comparatively longer time as the investigator was to interact with each and every child at the time of test administration

Tool for Hindi Language Test

Tool No. 2 was designed to assess the reading, writing and speaking competencies in Hindi language. It consisted of 9 test items, with 16 sub-items of 50 marks.

Administration of Tools

As given in the design and the sample size of the study, it was intended to administer the two tools to 20 children for each AS selected under the study, but the number varied from 7 to 22 in mathematics and from 7 to 25 in Hindi language. The Hindi language test was administered on the first day to 407 children, and the mathematics test to 393 children on the other day in each school The tools were administered by the investigators themselves with the help of the JPFs

Provision was also made for refreshment for the children. On an average it took about 3-4 hours to administer one test to 15 students as it needed individual guidance to make them understand the meaning of each test item. The help of AS teachers and the educated village-community members, wherever available, was also utilised in the administration of the test. Guidelines to investigators were also provided regarding the technique of administration of the tools and of data collection for the small children. The help of the DIET lecturer incharge of AS was also taken for this task.

To ensure authenticity of the study, the visits were made by surprise and were unannounced, though the DPOs and the DIETs were informed well in advance about the visits of RIE investigators visiting different AS for data collection The DIETs and the DPOs were kept as the nodal agencies. Investigators contacted the concerned DIETs/ DPOs. A one-day discussion-cum-orientation session for the DIET lecturer, DPO, women project coordinator, BRC coordinator and the supervisors was organised by the investigator to explain the purpose and modus operandi of the evaluation study. The list of the 10 AS functioning in the block was also taken from the DIET lecturer/ DPO. The selection of the AS for data collection was kept confidential and this was decided just before going for data collection, in order to feel the real pulse of the AS project.

Major Findings

The major findings in both the subjects are given below:

Learning Achievement in Mathematics

The learning achievement of children in mathematics has been assessed competency-wise for each of the 30 schools as well as for each district The schoolwise performance of children in the different competencies is shown in Table 2. Rampura AS (N:22) situated in Khilchipur block of Rajgarh district has topped with the highest mean score of 48 18 out of 50 marks whereas Kannoji AS (N:11) of Rewa block of Rewa district could succeed only in securing 8.9 as the mean score. The situation of Mudirya AS (M: 10) of Mahuganj block of the same district is also not encouraging as the children of this school could get only 11.0 as the mean score which is much lower than the overall mean score of 28.45. Late opening of the AS in Rewa district may be one of the reasons for the poor performance of these two schools of Rewa district. The teachers of these two schools were not regular. The success of the Rampura AS is attributed to the dedication of the two local teachers. Both of them are first-class graduates and take great interest in teaching. They are punctual and regular. They are highly respected by the community members. Punctuality, regularity, subject-knowledge and interest in teaching can be identified as some of the factors contributing to the success story of any AS.

Districtwise mean scores of children are depicted in Table 3 from which it can be easily inferred that the performance of the children studying in the Rajgarh, Raisen and Betul districts with the mean scores, respectively, of 40.16, 29.71 and 29 43 is better. On the other hand, the children studying at Dhar, Rewa and Sehore are found lagging behind, with the mean score, respectively, of 20.86, 23 26 and 27.96. In Betul, both the schools covered by the study lie within a radius of 10-20 km, which is ideal for regular monitoring and evaluation. Both the schools were held regularly. The teachers of these schools are very enthusiastic, friendly toward the children and enjoy a good rapport with the parents and the community members. Mr. Anant Gangola, District Project Officer (DPO) of Raisen district, is a highly respected youth in the area. He enjoys an excellent rapport with the teachers, the supervisors and the community members. He is a committed social worker and works with the zeal of a missionary. Some of the AS in Raisen district are scattered over a distance of more than 30 km from the block HQ, but even then these are visited regularly by the DPO. The situation is quite encouraging in Rajgarh district due to the concerted efforts of the DIET lecturer in charge of AS, the DPO, the teachers and all other functionaries of AS as already mentioned Schools in Dhar district lie in the range of 18-75 km from the district HQ resulting in poor monitoring and supervision. 91% of the children in Dhar district belong to the ST category and only 45-61% were found present at the time of visit. Though teaching-learning material was available in all the schools visited, but it was not in an adequate quantity. All these factors may be responsible for the poor performance of children in this district.

Itemwise Analysis in Terms of Levels of Learning

The itemwise mean scores of the children of each AS as given in Tables 2 and 3 reveal that except Item Number 1 (concept of 'small/big, one/many and far/near) in which the children of Betul district secured the highest mean score of 5.48 out of 6 marks, in all other items, the children of Rajgarh district have fared well uniformly as compared to their counterparts in other districts The mean scores in all the items for the children of Rajgarh district exceeded the overall mean scores. Besides the dedication of the teachers as

TABLE 2

Schoolwise Performance of Children in Different Competencies of Mathematics (N = 393)

Sr No	Distt.	Block	Village	N	1	2	3	4	5	6	7	8	9	
			Competency		*Small/ Big/ One Many Far/ Near*	*Jointing of diag of obj. in increasing order*	*Counting of Objects Writing*	*Addition Statement*	*Add. in Col*	*Subtraction Statement*	*Subtraction in Col*	*Writing in increasing order*	*Writing in decreasing order*	*Total Mark*
			Marks Allotted		6	4	12	6	6	4	6	3	3	50
					Mean Score									Total Mean Score
1	Betul	Betul	Sapna Colony	8	4.75	2 63	10.00	6.00	5.25	3.00	5 00	2.62	2 62	41 87
2			Thanimal	15	6 00	00 00	5.60	0 80	3 86	1.13	2 13	1.66	1.60	22.80
3		Sardarpur	Nandna	15	0 53	1.86	4.93	1 60	2.66	0.00	1 60	1 06	1.00	15.26
4			Deogarh	17	5 29	3.05	9 94	1.41	4.58	1.71	4 58	2 29	2.47	35 32
5	Dhar		Chuna Bhatipura	18	5.11	2.22	10 72	0 00	4.55	0 00	3.22	2.05	2.16	30 02
6			Phalkiyapura	10	3 40	2.40	3.00	0.00	1.60	0.00	1.20	0.60	0.60	12 80
7		Nalchha	Bheru Ghatpura	16	3 75	2 25	2.37	0 37	1 37	0.00	0.87	0.18	0.18	11.37
8			Banjarpura	21	0.00	1 33	5 57	0.00	2.66	0 00	2 28	1.47	1.42	14.76
9			Ghont	14	3.42	3.07	9.85	1.71	4 20	0 00	4.20	1.92	2.07	30.64
10		Badi	Kothri	9	4 11	1.77	9.22	4.66	4.88	0.00	2 88	2.33	2 33	32 22
11	Raisen		Nangpur	15	1.40	0 26	5 60	0.40	4.40	1 33	2.13	2.46	2 40	20.40
12		Obedulla	Kheritappa	8	3.00	2.00	10 62	3 75	5 50	0.50	4.75	1 00	2 50	33.62
13		Ganj	Camp No 5	7	4 20	2 85	10.71	6.00	6.00	2.85	1 71	2.85	2.28	39.57
14			Bambori	7	1 42	0.57	6.85	3.42	3.71	0 57	4.28	3 00	3.00	26 85
15			Rampura	22	4.77	3.81	11 59	6 00	6.00	4 00	6 00	3 00	3.00	48.18

TABLE 2 (Contd)

Sr No.	Test Item No.				1	2	3	4	5	6	7	8	9	
	Competency				*Small/ Big/ One Many Far/ Near*	*Joining of diag of obj in increasing order*	*Counting of Objects Writing*	*Addition Statement*	*Add. in Col*	*Subtraction Statement*	*Subtraction in Col*	*Writing in increasing order*	*Writing in decreasing order*	*Total Mark*
	Marks Allotted				6	4	12	6	6	4	6	3	3	50
	Distt	Block	Village	N	Mean Score									Total Mean Score
16		Khilchipur	Mannipura	12	4.66	3.33	6.41	3.00	5.33	1.66	5.33	2.75	3.00	35.50
17	Rajgarh		Manpura	19	5.15	2.73	9.47	5.36	5.78	3.78	5.89	3.00	3.00	44.21
18			Badisewni	10	5.20	3.60	8.60	4.20	5.40	—	5.00	2.70	2.60	37.30
19		Narsinggarh	Chhabra	14	3.78	2.85	6.78	5.07	4.42	3.85	5.00	2.92	3.00	37.71
20			Rukmiyakhedi	13	1.61	2.15	6.69	3.69	5.53	1.53	3.69	2.92	2.00	29.84
21			Odkikjurd	20	4.10	1.60	4.45	2.40	1.80	2.00	1.50	1.35	1.35	20.55
22		Rewa	Kannojh	11	3.27	1.45	0.80	1.09	1.45	—	0.50	0.27	—	8.90
23	Rewa		Bayanbohriatola	13	5.53	4.00	8.30	3.20	6.00	4.00	5.60	3.00	3.00	42.66
24		Mahuganj	Lakhaiya	7	6.00	2.85	6.50	5.10	5.71	3.42	4.00	3.00	3.00	39.71
25			Mudriya	10	1.60	—	3.20	0.60	3.20	0.80	1.20	0.30	0.10	11.00
26			Patenshripath	11	3.72	2.80	5.18	—	4.00	0.72	2.54	1.63	0.36	20.95
27		Ichhawar	Goiyalkhedi	13	—	2.15	6.45	1.38	3.85	—	2.76	1.15	1.15	18.90
28	Sehore		Semariya	10	4.40	—	5.40	0.00	3.60	0.00	2.00	0.90	—	16.50
29		Budhni	Dhankot	10	—	3.20	8.50	4.20	5.60	1.60	5.40	2.20	1.80	32.40
30			Indiranagar	18	—	2.00	10.11	5.33	5.11	4.00	6.00	3.00	2.77	38.33

TABLE 3
Districtwise Performance of Children in Different Competencies of Mathematics (N : 393)

Sr No	Test Item No		1	2	3	4	5	6	7	8	9	
	Competency		Small/ Big/ One Many Far/ Near	Joining of diag. of obj in increasing order	Counting of Objects Writing	Addition Statement	Add in Col.	Subtraction Statement	Subtraction in Col.	Writing in increasing order	Writing in decreasing order	Total Mark
	Marks Allotted		6	4	12	6	6	4	6	3	3	50
	Distt.	N	Mean Score									Total Mean Score
1	Betul	23	5.48(+)	0.91(-)	7.13(-)	2.61(+)	4 34(+)	0.84(-)	3 13(-	1.99(-)	1.95(+)	29.43(+)
2	Dhar	97	2.93(-)	2 13(-)	6.40(-)	0 56(-)	3 03(-)	0 3(-)	2 41(+)	1.71(-)	1 39(-)	20 86(-)
3	Raisen	60	2 82(-)	1.45(-)	8.55(+)	2 40(-)	4 68(+)	0.8(-)	3 28(-)	2 23(+)	2 38(+)	29 31(+)
4	Rajgarh	90	4.27(+)	3 76(+)	8.66(+)	4.76(+)	5 48(+)	2 81(+)	5.29(+)	2.91(+)	2.81(+)	40 16(+)
5	Rewa	72	4 01(+)	2 09(-)	4 73(-)	1 99(-)	3.42(-)	1 83(+)	2.46(-)	1.54(-)	1.28(-)	23 36(-)
6	Sehore	51	0.86(-)	1 88(-)	7.94(+)	3 06(+)	4 59(+)	1 73(+)	4.27(+)	1.62(-)	1.67(-)	27.93(-)
	Average mean score	393	3 29	2 29	7.18	2.52	4 19	1 45	3.50	2 04	1.91	28 45

mentioned earlier, regular monitoring by the DPO through surprise visits to the AS and the monthly review meetings and motivation by the motivated teachers also contributed towards the better performance of the children. In these two districts, the students were found quite regular, except in one school. On the other hand, the children of Dhar district lagged behind in all the test items Dhar is a tribal district The problem of understanding the local dialects by the investigators, long distances of AS from the block and the district HQ resulting in poor monitoring, may be some of the reasons for the poor performance.

Comparison of Items 4 and 5 reveals that the mean scores of all the children are better in the item on addition in column than the statement-type item which requires an understanding of the mathematical operation. A similar trend was observed in Items 6 and 7 on subtraction Exactly the same trends have been reported in earlier studies of NFE children (Gupta, 1993) and Shikshak Samakhya Schools (Gupta, 1996). However, the items on writing numbers in increasing and decreasing order proved a but simpler. Children fared well in the item on writing numbers in increasing order than in the one on writing numbers in decreasing order.

Sexwise Performance of Children in Mathematics

Mean scores, SD and 't'-values for boys and girls of Rajgarh district were found as 41.28 and 38.44, respectively, which are the highest mean scores in comparison to all the other districts The boys of Rewa and Dhar were found to be the lower level of 21.36 and 21.62, respectively. The girls of Dhar district were found to be at the still lower level of 17.86 but the girls of Rewa performed slightly better then their boy counterparts by securing 24.08 as the mean score. Statistical analysis reveals that there is no significant difference in the performance of the boys and girls of any of the six districts as the 't'-values of the six districts in each case are lower than the Table 't'-value (Garett and Woodsworth, 1981). However, when the learning achievement of all the 241 boys is compared with that of 152 girls, there is found to be a significant difference in their learning achievement at 05 level, as the calculated 't'-value of the order of 2.24 (for df:393) comes out to be higher than the Table 't'-value of 1.65 Thus it can be inferred that in each district there is no significant difference in the learning achievement of girls and boys, but on the whole there is a significant difference, and tilt is in favour of the girls.

TABLE 4

Comparison of Learning Achievement of Boys and Girls of Six Districts in Mathematics (Boys : 241; Girls : 152)

S. No.	*District*	*Boys*			*Girls*			*'T' value*	*Inference*
		N	*Mean*	*SD*	*N*	*Mean*	*SD*		
1	Betul	12	30.41	12.39	11	29.90	11.95	0.09	*NS
2	Dhar	67	21.62	14.52	30	17.86	15.77	1.09	NS
3	Raisen	36	29.63	10.44	24	30.66	9.38	0.27	NS
4	Rajgarh	63	41.28	7.65	27	38.44	8.70	1.44	NS
5	Rewa	36	21.36	16.59	36	24.08	16.31	0.94	NS
6	Sehore	27	24.51	12.44	24	28.75	11.54	1.24	NS
	Overall	241	28.71	12.50	152	31.69	13.13	2.24	**Sig. at .05 level

*NS = Non-Significant ** Sig.= Significant

Learning Achievement of Children in Hindi Language

The districtwise and sexwise learning achievement of children in Hindi language are depicted in Tables 5 and 6. It is observed from these tables that the performance of the children of Rajgarh, Raisen and Sehore districts with the mean scores of 24.07, 23.77 and 21.63, respectively, is found better than that of the children of Betul (17.04), Rewa (15.10) and Dhar (13.01). No significant difference is found in the performance of boys and girls in all the districts except Sehore where the girls are found to perform better. On the whole, the girls (N:160) are found better placed than the boys (N : 247).

TABLE 5

Distnctwise Performance of Children in Different Competencies of Hindi Language (N: 407)

S No	Test Item No.		1	2	3	4	5	6	7	8		9		
	Competency									Identi. of pictures and story telling				
			Writing own name	Writing mother's name	Writing father's name	Writing village name	Poem Recitation	Word formation	Making words of similar sound	Sentence reading	Pronounciation	Flow of speech	Event sequence	Grammar	Total Marks
	Marks Allotted		2	4	4	2	4	6	6	6	4	4	4	4	50
	Distt	N	Mean Score												Total Mean scores
1	Betul	23	1.61(+)	2.17(-)	2.29(+)	1.17(-)	2.09(+)	2.66(-)	1.04(-)	1.43(-)	0.91(-)	0.83(-)	0.83(-)	0.78(+)	17.74(-)
2	Dhar	103	1.26(-)	1.67(-)	1.68(-)	1.10(-)	1.03(-)	2.37(-)	0.92(-)	1.52(-)	0.36(-)	0.43(-)	0.77(-)	0.21(-)	13.01(-)
3	Raisen	53	1.51(+)	2.43(+)	2.68(+)	1.49(+)	1.94(-)	3.26(+)	1.74(-)	2.61(+)	1.57(+)	1.74(+)	1.40(+)	1.38(+)	23.77(+)
4	Rajgarh	91	1.50(+)	1.87(+)	1.87(+)	1.71(+)	1.46(-)	3.93(+)	2.98(+)	3.22(+)	1.48(+)	1.55(+)	1.60(+)	1.33(+)	24.07(+)
5	Rewa	85	1.19(-)	1.16(-)	1.44(-)	1.16(-)	1.76(+)	2.56(-)	1.35(-)	1.56(-)	1.21(+)	0.54(-)	0.69(-)	0.45(-)	15.10(-)
6	Sehore	52	1.71(+)	2.14(+)	2.10(+)	1.07(-)	2.08(+)	3.38(+)	2.67(+)	2.31(+)	1.21(+)	1.00(+)	1.04(-)	0.79(-)	21.63(+)
	Overall mean score		1.41	1.73	1.83	1.30	1.59	3.02	1.81	2.04	1.09	0.97	1.06	0.77	18.69

TABLE 4

Comparison of Learning Achievement of Boys and Girls of Six Districts in Hindi Language (Boys: 247; Girls : 160)

S No	District	Boys			Girls			'T' value	Inference
		N	*Mean*	*SD*	*N*	*Mean*	*SD*		
1	Betul	12	16.75	11.34	11	18.54	12.19	0.36	*NS
2	Dhar	67	14.22	9.04	36	11.00	8.18	1.82	NS
3	Raisen	34	22.64	9.88	19	25.15	9.31	0.90	NS
4	Rajgarh	66	24.21	13.24	25	23.05	15.60	0.32	NS
5	Rewa	40	14.00	10.17	45	16.02	9.89	0.91	NS
6	Sehore	28	18.64	10.33	24	25.04	8.18	2.44	NS
	Oveall	247	16.37	10.84	160	18.59	10.54	2.04	**Sig. at .05 level

* NS= Non-Significant   ** Sig = Significant

Comparison of Achievement Level of Children in Mathematics and Hindi Language

The districtwise mean scores of children in mathematics and Hindi language are graphically depicted in Fig. 1, from which it can be concluded that the performance of children in mathematics is found to be better than in Hindi language in all the districts. Some hard spots have also been identified in the form of 11 AS in which the performance of the children in both the subjects is found poor as shown in Fig. 2. From Fig. 2, it is also observed that in 9 of 11 schools (4 in Rewa, 3 in Dhar and one each in Raisen and Sehore), the children are again found lagging behind in Hindi language. The achievement level of boys and girls, i.e. (MLLs, NCERT, 1991) to which level of learning they have reached is compared in Tables 7 and 8 which indicate that in all the districts, the performance of children is better in mathematics than in Hindi language. On the whole, 25.65% girls and 30.70% boys or 28.75% of children (N: 393), have reached the mastery level of 80 in mathematics but this task in Hindi language could be accomplished only by 3.12% of girls and 2.83% of boys or 2.94% of children, out of a total of 407 children. Non-availability of teaching-learning material in time and the Hindi textbooks and pedagogy being followed at AS may be some of the factors responsible for the poor achievement in Hindi language. This aspect needs serious consideration by the AS functionaires

TABLE 7

Districtwise Achievement Level of Children in Mathematics (N:393) and Hindi Language (N:407)

S. No	District	Girls/ Boys	Achievement Level of Children													
			Mathematics							Hindi Language						
			<50%		51-79%		>80%		Total	<50%		51-79%		>80%		Total
			N	%	N	%	N	%		N	%	N	%	N	%	
1	Betul	Girls	5	45 5	3	27.3	3	21.3	11	8	72 7	2	18.2	1	9 1	11
		Boys	5	41 7	4	33 3	3	25 0	12	9	75 0	3	25.0	0	0 0	12
2	Dhar	Girls	20	66.7	7	23.3	3	10 0	30	35	97.2	1	2 8	0	0 0	36
		Boys	35	52 2	24	35 8	8	11.9	67	60	89.6	6	9 0	1	1 5	67
3	Raisen	Girls	8	33.3	11	45.8	5	20 8	24	6	31 6	13	68 4	0	0 0	19
		Boys	13	34 1	15	41.7	8	22 2	36	21	61 8	12	35 3	1	2 9	34
4	Rajgarh	Girls	9	33 3	4	14 8	14	51 9	27	11	44 0	11	44 0	3	12.0	25
		Boys	4	6 4	16	25 4	43	68 3	63	29	43.9	33	50.0	4	6 1	66
5	Rewa	Girls	6	16.7	21	58 3	9	25.0	36	32	71 1	13	28 9	0	0 0	45
		Boys	21	58 8	6	16 7	9	25 0	36	35	87.5	4	10 0	1	2 5	40
6	Sehore	Girls	9	37 5	10	41 7	5	20 8	24	13	54 2	10	41 7	1	4 2	24
		Girls	13	48 1	11	40 7	3	11 1	27	20	71 4	8	28 6	0	0 0	28
	Total	Girls	57	37 5	56	36.8	39	25 7	152	105	65 6	50	31 3	5	3 1	160
		Boys	91	37 8	76	31 5	74	30 7	241	174	70 4	66	26.7	7	2 8	247
			148	37 65	132	33 6	113	28 75	393	279	68.6	116	28 5	12	2 94	407

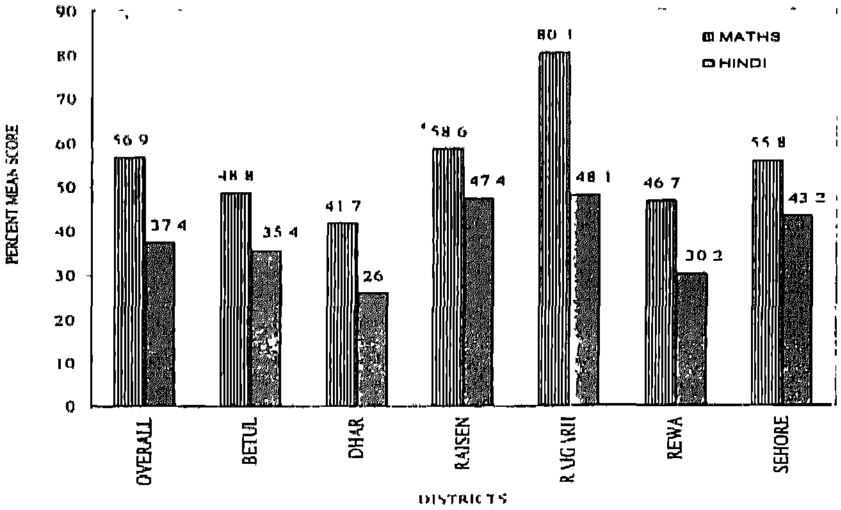


FIG. 1 : Districtwise Learning Achievement of Children in Mathematics and Hindi Language

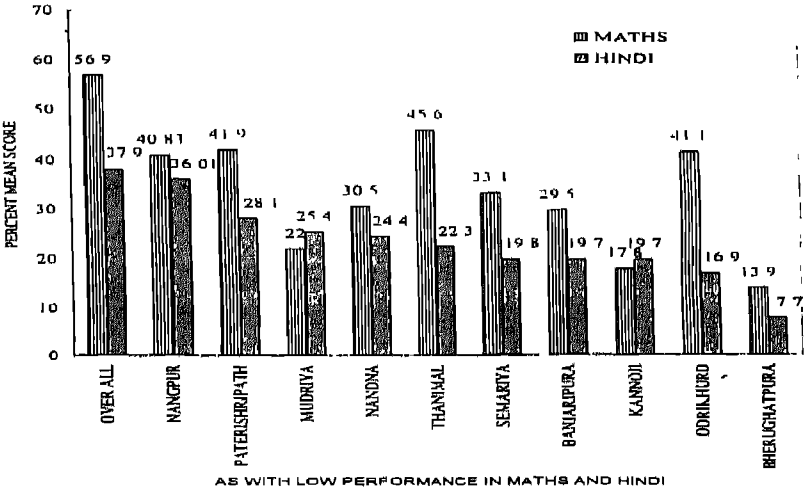


FIG. 2 List of AS Having Lower Performance in Both Maths and Hindi Language than Overall Mean Scores

TABLE 8

Subjectwise Achievement Level of Children

Subject	Achievement Level of Children					
	Scores					
	<50%		51-79%		>80%	
	N	%	N	%	N	%
Mathematics (N 393)	148	37 65	132	33 5	113	28 75
Hindi Language (N 407)	279	68 56	116	28.5	12	2.94

Conclusion

The study has revealed that the children have done better in mathematics than in Hindi language Similar observations were made in the earlier evaluation studies of NFE centres (Gupta, 1993) and Shikshak Samakhya Schools (Gupta, 1996) The AS of Rajgarh and Raisen are better placed in terms of learning achievement in both the subjects, whereas the AS of Rewa and Dhar districts are lagging behind Some of the probable reasons for fast learning have been identified as availability of local committed and qualified teachers, effective monitoring and supervision, regular holding of the AS, timely supply of teaching-learning material, and in adequate numbers. The mistakes of children, who were found committing mistakes, related to 'Matras', in Hindi language.

Implications of the Study

The results discussed in the paper are strong indicators of the efficacy and functionality of the inputs being provided, either in the form of books or teaching-learning material or the pedagogy being followed by the teacher for transacting the curriculum, because the learners are the same with the same, environment and with the same, socio-economic status of the parents. If the children can do well in mathematics, then why not in Hindi? Each and every person associated with the AS — may be parents, community members, teachers and supervisors, DIET lecturers, DPO staff or the personnel of RGPSM and members of the State Task Force — will have to think very seriously so that the children can do well in Hindi language also. It is observed that most of the mistakes committed in Hindi language are those of 'Matras Similarly, in mathematics the statement type item involving subtraction proved the toughest one for the children. The low mean scores of thechildren in simple statement type items in mathematics (2.52 out of 6 marks in addition and 1.45 out of 4 marks in subtraction) are indicators that there is very little emphasis on understanding of the concepts. These findings may help the planners and the real users to improve multigrade/ multilevel teaching for universalisation of primary education in the country.

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30

EFFECTIVENESS OF THE STRATEGIES IN DEVELOPING MAP-READING SKILLS IN LARGE-SIZED CLASSES AT PRIMARY STAGE — A STUDY

T.V. Lalitha

The objective of the study was to find out the map-reading skills in a large-sized class at the primary stage. It was found that attention given to the development of map-reading skills was very limited. A number of learner-centred activities were developed to encourage the students to acquaint themselves with map-reading skills. The study revealed that the right kind of maps, properly used, would stimulate the interest and imagination of the children and create the motivation to know our environment in a systematic way.

Introduction

The teachers of the primary school, at present, normally come across large-sized classes. They find it difficult to manage these classes and organize activities for effective learning. This study provides an insight into the problems faced by the investigator in large-sized classes and suggests various strategies for the teachers to develop map-reading skills effectively in such classes.

The primary stage is the first step of the child's exposure to its immediate environment. It is the responsibility of the teacher to prepare the children for life and help the children to acquire the knowledge and attitudes necessary for adjustment to the environment.

The subject matter of Environmental Studies is centred around human beings and their environment — physical as well as social. It also helps children to understand how people live and work in different physical conditions and how they stand in relation to the family, community, state, country and the world.

To know an environment it is essential to know its geographical set-up which broadly includes land forms, water bodies, human factors, distances, political features, climate resources transportation and location. This knowledge can be acquired by learning to read maps and the globe, which involves a variety of skills.

At present, the attention given to develop the map-reading skills at the primary level is very limited. Children do not study maps to understand maps. Merely reading a name on a map does not mean that the students have developed any map reading skills Map-reading means understanding the relationship between the symbols on maps and the real environment.

Map-reading skills are not developed by the teachers deliberately in a systematic way. The duration given to map-reading is also very limited. This has led to a lot of confusion among children in comprehending concepts in Environmental Studies.

At its best, a map is a representation of the earth's surface. It is not concerned with reality; it is merely a symbol for reality. Thus maps are not self explanatory. Their specialised symbols have to be learned. This requires specific and sequenced teaching. So, an attempt has been made by the investigator to encourage the children to acquaint themselves with map-reading skills and also to study the effectiveness of strategies in developing these skills

The investigator found that the children at the primary level always like to remain busy. They possess very strong imagination which can easily transfer them to the world of imagination. They are always eager to gain new experiences through their senses. They want recognition from the teacher and their peer group. They like company and enjoy working and playing in groups. The investigator took advantage of these characteristics of children to make learning more attractive and effective.

Objectives

- To study the effectiveness of field trips and tours in developing map-reading skills.
- To study the effectiveness of video films in developing map-reading skills

- To study the effectiveness of narration and story-telling in developing map-reading skills.
- To study the effectiveness of individual/group learning activities in developing map-reading skills

Methodology

The study was conducted on a sample of seventy students of Class IV, Demonstration School, RIE, Mysore, in the age-group of 8 to 9 years during the academic year 1997 from July to September. Children were tested for their knowledge on Sides and Directions, which is a prerequisite for developing map-reading skills. Individual activities and drilling were undertaken for needy children.

To carry out the study, a number of learner-centred activities were organised:

- Activities for motivation through field trip, tour, video film and stories.
- Activities for developing map-reading skills —individual and group activities.

The required materials such as pictures, charts, diagrams, maps, globes and models were prepared and used for developing the required skills for reading maps. The study also aimed at developing a sense of the scientific processes of observation and classification, measurement and generalization, through peer-group learning, discussion, demonstration and group work.

To motivate students to develop map-reading skills, the following activities were undertaken.

- A field trip to the Regional Museum of Natural History, Mysore, was undertaken. Here students could visualize a variety of plants and animals and see : a dioramic representation of the Western Ghats; the section on tropical rain forests; wet lands and its associated environment captured in a diorama, the section on the sea with marine habitat; a huge panel showing River Cauvery The life line of Karnataka and Tamil Nadu and conservation of natural resources. The students enjoyed the trip and were interested to know more about the environment
- A video film on maps was also screened as the next step to motivate students to study. In this film schoolmaster uses his

immediate environment to teach distance, measurement and direction. A student of the school uses this knowledge to read a map given by his father to find a route to his grandmother's house. This created a great interest among the students to know about maps; to learn to read maps and to draw sketches of directions of their friends' houses, school, bus station, etc.

After the above, the following activities for developing map-reading skills were undertaken:

Activity 1

To make the learners know and understand the meaning of colours and symbols used in maps, the investigator asked them to draw scenery in their drawing books. She found that the learners unknowingly had used the blue colour for water, green for trees and grass, brick-red for soil and brown colour for mountains. In the next step she showed them the physical map of India The learners, were made to observe the colours used in the map. With help of the learners, the teacher explained the concept of sea-level, from which the elevation or height of land is measured and the different colours used as symbols for representing different land elevations, for example, darker the green, lower the attitude, and the darker the brown, the higher the attitude. The teacher made the learners understand the conventional colours and conventional symbols used in the physical map Different types of maps such as weather maps, climatic maps, natural vegetation maps, and so on, were mentioned Practice exercises such as Fill in the Blank, and Match Colours with Symbols were given to the learners to make the concept clear. The investigator used whole-class teaching at the beginning of the lesson, and explained how the class should work and what they should do. The learners showed interest in individual work and were fully involved in drawing and colouring. The teacher had sufficient time to go round the class and supervise and guide the students.

Activity 2

A number of outdoor activities were planned to make the learners understand concepts like distance, measurement and the use of map-scale. These activities were carried out in small groups of five each. Each group was asked to measure the distance between different objects, such as the distance between two trees, two walls, two buildings, and so on, by walking from one to the other and noting down the number of steps they took to cover the distance

With teacher-guided discussions they came to know that these measurements could be converted into inches and metres

Now they were in a position to apply this knowledge to maps and conclude that it is difficult to draw a map of any area's actual size on paper. Thus a short distance on the map stands for a much longer distance on the earth. The scale line helps to measure distances on the map. Using a map scale was demonstrated to the class and learning exercises were given to the learners to find the distance between two given places.

The investigator had to make extra efforts to maintain discipline in the class when activities were conducted in groups and during the discussion sessions.

Activity 3

The students were shown picture cut-outs of some of the heavenly bodies like the sun, moon, earth and mars. By observing these pictures the students concluded that all heavenly bodies/planets are round in shape. The teacher showed them the globe — the model of the earth. She narrated the story of people's efforts in the past to know the shape of the earth. By looking at the globe, the learners could correlate colours with concepts and list the uses of the globe Students were asked to collect pictures of the earth and paste them in their drawing books.

The investigator found that the learners were interested in listening to stories and were keen on observing pictures, drawings and model of the earth.

Activity 4

To enable the students to learn about the different land forms and water bodies, the teacher took the learners to the sand tables. The they were divided into smaller groups and were allowed to play in the sand. The teacher encouraged and guided the students to form sand hills, hill ranges, passages on these hills, low areas in between the sand hills, and so on The students' attention was drawn to even and uneven land in the field

In the class, with the help of teacher-made maps and chalk and board, the teacher made sketches of plain, plateau, hill, mountain valley, gulf, bay cape peninsula and island and explained these to the learners. Water bodies were made known to the students through pictures and drawings. The students took part in all activities with great enthusiasm. They really enjoyed playing on sand tables, drawing and colouring different land forms and arranging pictures

Activity 5

To develop freehand drawing and sketches, the learners were divided into seven groups of ten each. They were asked to 'find the treasure' by following the given clues in the playfield. This activity helped the learners to recall directions. Later on the learners were asked to draw sketches indicating the route of their treasure hunt. The learners were also encouraged to draw sketches of their classroom, their school and its surroundings and their house and its surroundings.

The students were given both individual and group assignments to trace the outline map of their district, State and country. In the above activities learners had lots of fun in 'finding the treasure', drawing sketches and tracing maps

Activity 6

The learners were enlightened regarding the use of several of the signs and symbols found in maps For example, 0 — > for a city.

•	for capital cities.
+ + + + + + +	for railway lines.
--,--,--,--,	boundaries.

Practice exercises were given to the learners to learn the signs and symbols used in the map. Learners were also given an assignment to observe the road signs, draw them and indicate what they say. After these activities, the learners could easily locate a given place on the map or mark it on the outline map of India.

Evaluation

To assess the achievement level of the learners, a test was conducted. Test items included multiple-choice questions, identifying true or false statements, one-word answers, fill in the blanks, one sentence answers. Matching symbols with meanings, drawing, locating places on the map and marking given places on the outline map of India

Result

The performance of the learners was analysed. A significant change was noticed among the learners in reading maps Out of 70 students, 60 were masters and 10 were non-masters

The following were identified as the causes of non-mastery among the 10 students.

- Medium of Instruction
- Frequent Absenteeism
- Lack of concentration
- Slow in grasping things
- Socio-economic background of students
- Lack of parental support, supervision and guidance.

To give moral support to and uplift these non-masters, remediation was taken up. The investigator started observing them during learning sessions, developed free interaction with them to remove their fear and shyness, gave attention to their smallest problem, entrusted responsibility to them when group activities were going on to build up self-confidence in them, and proceeded to give instruction from simple to complex and concrete to abstract.

Some of the activities were repeated and reinforced for the non-masters. They were given individual attention to the extent possible so as to make them more successful participants in the teaching-learning process.

Major Outcomes

It was found that the students were able to

- Recall sides and directions with ease.
- Relate concepts with colours.
- Measure the distance between two given places using the scale
- Explain concepts with drawings, and locate a particular place when, sketch was given.
- Draw simple maps of their surroundings and trace maps of individual States and, the country — India.
- Identify given places on the map and mark them on the outline map.

It was also formed that

- The teacher had to make a little extra effort to maintain discipline and organise activities in a large-sized class.
- The teacher needed more time to plan activities and prepare learning aids.
- The teacher and the students could interact and transact better in group activities
- The teacher could give individual attention while conducting group work and students could learn effectively in peer groups.

Implications of the Findings for School Effectiveness

At the primary stage, child-centred activity-based strategies have immense potentialities in motivating and encouraging learners to participate in the teaching-learning process and attain the expected achievement level. On the other hand, they also motivate teachers to go beyond the prescribed text. Map-reading skills hold a key position in understanding our environment easily and interestingly. The right kind of maps, properly used, will stimulate the interest and imagination of the children and create effective motivation to know our environment in a systematic way.

31

ENHANCING LEARNING SCHOOL LANGUAGE OF DISADVANTAGED LEARNERS THROUGH THE USE OF HOME LANGUAGE IN MULTIGRADE SCHOOLS

Premlata Sharma

The aim of the study was to identify the language learning difficulties of children studying in Classes I and II of two multigrade schools, to develop guidelines for assimilating home language with school language and to assess the effectiveness of the use of home language for enhancing school language learning. The study revealed that mixing of home language with school language in suitable proportion would facilitate raising the quality of learning school language. It was suggested that supportive bilingual teaching-learning material should be developed and provided to teachers in advance.

Context

For providing quality education to all, there is need to give greater attention to educational planning for the educationally disadvantaged groups as their accessibility to quality education is very low in comparison to the educationally advantaged groups The performance of high achievers from a disadvantaged educational setting is found to be equal to that of the under acheivers from the educationally advantaged (Sharma 1988). The enrolment and retention rates shown in various surveys of the country are lower for these groups. The enrolment of children in the age-group of 5-9 years is 25 65% in rural children and 70.24% in urban children

Nearly 74 per cent of the Indian population lives in rural areas. The number of children in this age-group who are out of school is 78 million out of which 36 million are boys and 42 million are girls, and the number of SC, ST and rural children can be quite large due to various socio-economic educational reasons. The positive picture regularly given by various educational documents shows that the enrolment rate has increased approximately from 19.20 million to 108.20 million from 1951 to 1994, in total, and for girls from 5.40 million to 46.50 million in the same period. These documents also further show that there is a decline in rates of dropout among the disadvantage groups from 1986 to 1996, that is, 9% for SC, 7% for ST, and 12.8% for girls, as shown below:

Drop-out Rates of SC, ST and Girls from 1986 to 1996

Declination Rate	*SC*	*D.R*	*ST*	*D.R*	*Girls*	*D.R*
1986	55%		72%		62.5%	
1996	46%	7%	65%	12.8%	49.7%	9%

In spite of the significant increase in educational facilities in terms of infrastructure, availability and accessibility of better primary schools and coverage of various disadvantage groups, the dream of 100% universal compulsory education still remain unfulfilled. The availability of primary schools to the rural population, at walkable distance has been reported to be 95%, and all the single-teacher schools except one percent have been converted to two teacher schools under the Operation Blackboard Scheme. The progress in terms of providing more teachers in primary schools from 1986 to 1996 is as follows:

Number of Teachers Working in Primary Schools

	1986	*1996*
Single-teacher schools	28%	01%
Two-teacher schools	33%	53%
Three-teacher schools	25%	22%
Four and more teacher schools	24%	24%

These figures appear to be very satisfying but in practice most of the single-teacher schools still remain as single teacher schools for all practical purposes. Providing joyful teaching and learning situations in these schools, under the present conditions seems to be difficult task due to the lack of properly trained teachers and the meager resources available to the teachers. The problem of providing quality education equal to that of the advantaged groups still remains in the incubation period. The educational planning of a country like ours which is multi-lingual, multi-cultural and with multi-educational standards, needs to devise an educational system seeking to meet the needs of all children including the disadvantaged and the disabled. The education process should become joyful for all children at the primary level, and not be a psychological burden.

Learning becomes joyful when it is related to the child's needs and is also imparted through the language known to the child In most of these schools, the children upto the fifth standards do not learn the basic skills of the school language. Their learning is rote-learning. They are unable to convey their thoughts in their own language. They cannot write four sentences of their own When their learning levels have been so low, it cannot be possible to expect that such learning could be joyful for the child The child is unable to enjoy his childhood just because his learning has to be learning by heart without any understanding This learning has no relevance for his/her healthy cognitive growth and development. The child's joy depends upon his/her understanding. This is possible only when the children are prepared to develop basic academic skills through the school language. Assimilation of the mother tongue with the school language is, therefore, essential in the initial stages of education, for developing proper language skills. Better language skills facilitates the child's developing his/her academic aptitudes properly. Through the use of the mother tongue the child gains confidence and learns to participate in the school language more adequately and comfortably.

The Sample

The sample was drawn from two multigrade schools of Tigrana Taluk in the Bhiwani district of Haryana. The number of children given intervention were 24 from Class I and 24 from Class II. Out of the 48 students, 28 were boys and 20 were girls The 48 students selected from Classes I and II of two multigrade schools of Tigrana taluk were speakers of a variety of Hindi which is different from the school language.

Tool Used

The language achievement test was used as a pre and post-testing tool.

Methodology

The pre and post-testing was done with the help of teachers working in these schools. The investigator oriented the teacher in using the bilingual approach for enhancing the school language of the children studying in these schools.

All the children were given the interventional programme. The mother tongue was assimilated with the school language in this way. In a multigrade situation the teacher cannot devote the full time to one or two classes or both for more time therefore, the teacher used alternate methods of teaching.

Methodology Followed for Enhancing School Language

Class I	*HL*	*and*	*SL Proportion*
	80%		20%

For example:

asman sir par gira — SL
asman sir pE paRa — HL

Mixing :

asman sir pE gira
gira (VISUAL) paRa
asman (picture) asman

Class II	*HL*	*and*	*SL Proportion*
	50%		50%

_n _ _n n n n
For example, LaRkiya bag me paudho ko pani de rahi hE. — SL

_ _n n _n n
chorIa bag mE paudya nE paNi deN lag ri se — HL

Mixing:

_n n n n n n
Larakiya bag mE paudya nE paNi de rahi hE

_n _ _n
Larakya (Visual) Choriya

n
Pani (Concrete) paNi

Management of Classes of Multigrade Schools

- Both Classes I and II were combined for the language periods
- Groups were formed by mixing children knowing SL properly with those who were poor in using the school language in this way
- The children were encouraged to use sentences of their own on the items/objects available in school. Feedback was given by teachers in terms of providing appropriate substitutes of words and sentences in the school language
- Participatory methods such as peer-tutoring, group work, self learning sessions and direct teaching were used to develop basic vocabulary items and sentence-making in the school language among Class I and Class II students
- The seating arrangement of the students of Classes I and II was done in this way:

..*.*

.*.*.*

- * = pupil good in SL; . = pupil poor in SL
- The teacher developed the school language by engaging the students according to their pace, intelligence and learning style
- These sentences were made by the students for developing tense and number in SL :

n .n n
1. Choriya Ja lag ri sE (pl)

n
2. Chori ja lag ri sE (sg)

n n
3. Choriya jawE (pl)

n
4. chori jawE (sg)

n
5. Choriya jawe gi (pl)

6. Chori jawE gi (sg)

The following intervention was planned to develop Tense and Number.

Intervention on Tense and Number

_n n n n
LaRakiya (choriya) jati hE (jawE)

LaRaki (chori) jati hE (jawE)

n _n n n n
Larakiya (choriya) ja rahi hai (ja lag ri sE)

LaRaki (chori) ja rahi hai (jan lag ri sE)

n _ _ n n
LaRakiya (choriya) jayengi (jawEgi)

_ _ _n n
LaRaki (chori) jayegi (jawaEgi)

- The teachers used group activity, monitorial assistance and self-learning material for teaching difficult words, sentences.

Activity Sheet 1: Group Work on Gender

LaRaki jati hE	= LaRaki jawE	LaRaka jata hE	= LaRaka jawE
buRhiya jati hE	= buRhi jawE	bRuha jata hE	= buRha jawE
bacci jati hE	= balak jawE	bacca jata hE	= bacca jawE
sima jati hE	= sima jawE	Syam jata hE	= sam jawE

Activity Sheet 2

Fill in the blanks

lata / = lata jawE

n
mahima aur lata / =mahima aur lata jawE

krishan aur rames / =krishan aur rames jawe

Make sentences by using appropriate verb forms from the given list:

n n n
(Khate hE, khata hE, khati hE, khawE, khawE, kate hE)

n

1. bacciya

n

2. buRhiya
3. buRhe
4. bacca

Analysis of Data

The main purpose of this study was to determine the relative effectiveness of the use of the home language on learning school language by Class I and Class II students studying in these schools. The Mean and SD of gain scores were computed and finally subjected to "t"-test. Table I gives details.

TABLE I

Mean, SD and 't' Values of the Post and Pre-tests of Classes I and II

	Mean		*SD*		
Class	*Post-test (N=24)*	*Pre test (N=24)*	*Post test*	*Pre test*	*t*
I	7.125	0.0416	3.933	3.085	6.877**
II	9.292	0.4580	4.805	4.746	6.408**

Table 1 indicates that the use of the home language for enhancing the school language learning was effective as the "t" values for Classes I and II for pre and post-test are significant at 0.01 level, which is very high.

Enhancing school language skills empowers the child to read, write and understand better in both of the languages, i.e., the home language and school language. It is particularly essential to use the mother tongue in multigrade teaching situations where most of the students come from poor linguistic background. In the multigrade learning situation, most of the learning takes place through the self-learning approach. Self learning is more effective when the child is competent to read, write and comprehend properly. It is in this context that the author decided to use the bilingual approach with the help of teachers for enhancing the school language (SL). The mixing of home language (HL) with the school language (SL), it was felt, would facilitate better academic participation by linguistically disadvantaged students. The proportions of HL and SL may be used in this way in multigrade schools .

Proportion of Mixing of HL with SL

	HL	SL
First standard	80%	20%
Second standard	50%	50%

The assimilation of HL with SL is very essential at least for children studying in classes I and II, particularly in educationally disadvantaged settings, to make them academically comfortable.

The learning difficulties of the child increase because of his/her inability to use the school language This inability goes on multiplying as the child goes to the next higher class and it may compel the child to drop-out from the system, which is the main cause of his/her frustration and stress. Keeping this problem in mind, the investigator provided guidelines to the teachers for designing the bilingual material for Classes I and II to enhance school-language learning.

Objectives

The main objectives of this study were

- to identify language learning difficulties of the children studying in classes I and II of two multigrade schools of TIGRANA district (through pretest on first language MLL competency based test).
- To develop guidelines for assimilating home language with school language.
- To assess effectiveness of the use of home language for enhancing school language learning.

General Observations

The difficulties faced by students in Class I and Class II in SL are stated below·

- There is difficulty due to possessing a small vocabulary in the SL.
- Comprehension of the SL is very poor due to the poor vocabulary and also because the tone and style of using the

SL by the teachers is different from those of the HL speaker. Besides, their structures are also different.

- The gender and number systems at the syntactic level, both SL and HL, are different. This causes a lot of difficulties in assimilating the SL pattern.

The use of the mother tongue in general helped the students in learning more words of the school language with greater understanding.

- More improvement was reported in comprehension of the school language than in the reading and writing skills in the SL
- More progress was noticed in reading skill than in the listening and speaking skills.

Major Outcomes

- Mixing the home Language with the school language helped in learning school-language skills better.
- More improvement was noticed in comprehension than in the reading and writing skills in the school language.
- Though the significance level between pre and post-tests is very high, 0.01, yet the improvement in learning grammar skills was observed to be very poor.
- Mixing of HL with SL helped the students to do better in other content areas also
- Learning the use of certain phrases was only contextual, and the children could not really appreciate these phrases in other contexts at the Class I level
- Students of Class II in general were better in learning SL than the Class I students.

Implications

Using the home language for instruction at the primary level has always been recommended but due to the magnitude of the problem it is not possible to do so throughout the primary stage. therefore mixing of HL with SL for Classes I and II in these proportions with the help of the teacher in multigrade schools can facilitate raising the quality of learning school language and this can further help in retaining the students in these classes by helping them to attain the Minimum Levels of Learning.

Teachers working in multigrade schools have no time to prepare such bilingual activities in HL and SL: so such supportive bilingual teaching and learning materials should be developed and provided to the teachers in advance. This material should be designed in such a manner that it is flexible and can be adjusted to the individual child's need. The textbooks and the additional supportive materials on integration of HL and SL should be developed exclusively for Classes I and II to help these children participate adequately in academic activities.

Conclusion

In a multilingual society like India's, where there are varieties of dialects spoken, the language problem manifests itself several ways: the number of languages one has to learn the quality of their teaching available in disadvantaged educational settings; use of the mother tongue as a medium of instruction for primary education. These are formidable issues in their own right and their implications for the curriculum can in no way be glossed over. Even when the same language is used both at home and in school, the difference in the forms of its usage creates greater and specific difficulties for the disadvantaged, particularly at the primary level of education as the child finds difficulty in using language codes effectively in the school language The impact of the home language which is a totally different from the school language has adverse effects on the total development of the child. Hence the teaching of the school language should be done by assimilating HL to academically integrate, the linguistically disadvantaged children at the primary level.

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